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Manning requirements for the Ready Reserve Force in 2001

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MANNING REQUIREMENTS FOR THE READY RESERVE FORCE IN 2001

by

Gaynell G. Barber

September, 1994

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Manning Requirements for the Ready Reserve Force in 2001

by

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ABSTRACT

This thesis examines the crewing requirements for the Ready Reserve Force (RRF). Several previous studies suggest that the U.S. will not be able to adequately man the RRF ships during another large-scale mobilization of the RRF for defense purposes, such as Desert Shield/Storm. Manning the RRF is not a one dimensional problem. Factors such as training, licensing, federal regulations, and the management practices of the private shipping industry must also be considered. This thesis looks at the manning dilemma from these different angles. Using information from past studies it proposes the number of qualified crew members needed to successfully mobilize the RRF in the year 2001.

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DEFINITIONS

COI . . . . . Certificate of Inspection

COMSC . . . . . Commander Military Sealift Command

CMMD . . . . . Commission on Merchant Marine and Defense

CMMM . . . . . Crewing the Merchant Marine for Mobilization

CMMPRP . Civilian Merchant Marine Personnel Reserve Program

DoD . . . . . Department of Defense

DOC . . . . . Department of Commerce

DOT . . . . . Department of Transportation

DSS . . . . . Operation Desert Shield/Storm

EMUSMF . . . . Effective Manning of the U.S. Merchant Fleet

MARAD . . . . . Maritime Administration

MMR . . . . . Merchant Marine Reserve

MMWSDA . . . . . U.S. Merchant Marine Workforce Supply and Demand Analysis 1979-1988

MSC . . . . . Military Sealift Command

NDRF . . . . . National Defense Reserve Force

ROC . . . . . Region of Conflict

ROS . . . . . Reduces Operating Status

RRF . . . . . Ready Reserve Force (Fleet)

SRP . . . . . Sealift Readiness Program

USCG . . . . . United States Coast Guard

USNR . . . . . United States Naval Reserve

USMMA . . . . . United States Merchant Marine Academy

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I. INTRODUCTION

Manning capabilities for Ready Reserve Force (RRF) ships have received much attention lately. RRF ships are inactive and are not manned until needed and then only U.S. citizens are authorized to man the ships. When called upon, the ships are manned by pulling experienced mariners from the civilian merchant marine commercial fleet. For lack of experienced available crews, 70 year old mariners were utilized to man RRF ships during Desert Shield/Storm. As commercial ships become more automated and the U.S. flag fleet continues to shrink, the number of U.S. mariners is expected to drop. When questioned about the substantial decrease in the expected number of U.S. merchant marine billets over the next 10 to 20 years, the Military Sealift Command stated:

> Current projections indicate that the number of seagoing jobs will dwindle to 3,125 by the year 2000. Factors which contribute to this projected decline in employment include the following:
>
> -high cost of union crews
> -lack of new construction for U.S. flag service (due in part to the high cost of American labor)
> -new ships being built are highly automated and allow operation by smaller crews
> -U.S. ship owners have chosen to operate ships under foreign flags of convenience with cheap maritime labor from third world nations (Notes from MSC Oakland, Spring 1993).

Several studies were conducted over the last decade to evaluate RRF manning capabilities and offer solutions for shortfalls. All concluded that there is a declining trend in the number of qualified U.S. mariners but each reported different levels of shortfalls. In some cases the commercial fishing industry was excluded. In other cases, the Great Lakes shipping industry and inland waterway shipping were excluded as sources of available manning. A close comparison of the required skill levels in these industries with the required oceangoing skill levels is warranted.

A. THESIS OBJECTIVE

The objective of this thesis is to determine the minimal manning requirements for the RRF as it will be configured in the year 2001.

The *primary research question is* what skill levels will be required to man the RRF and how many mariners of each skill level will be required?

Additional issues which are also addressed include:

1. What is the Ready Reserve Force (RRF)?
2. How many and what types of ships will make up the RRF in the year 2001?
3. How is the RRF activated in war or national emergency?
4. What skill levels are required for the RRF ships?
5. What positions (on each ship) do not require skilled laborers? How many unskilled laborers will be required?
6. What jobs are eliminated with advanced ship technology?
7. How many civilian mariners will be needed to man a

large-scale RRF mobilization in the year 2001?

The Ready Reserve Force (RRF) is an integral part of the United States' mobilization capabilities during war or national emergency. This thesis will examine the nation's ability to man these ships with qualified mariners.

B. RESEARCH METHOD

Through interviews and literature reviews the researcher gathered information on the past, present and expected future status of the U.S. merchant fleet manning capabilities. By comparing manning studies, regulations, and practices within the merchant marine industry suggested RRF manning levels for the year 2001 are proposed.

C. ORGANIZATION OF THESIS

Chapter II of this thesis provides background on how the RRF has been used and its importance during wartime mobilization and sustainment. Chapter III reviews five pertinent merchant marine manning studies and compares the results. Chapter IV reviews manning procedures for the RRF during mobilization for defense purposes. Chapter V examines the number of skilled mariners and unskilled laborers required to man merchant vessels. Included in Chapter V is an overview of the training and licensing required to crew an RRF ship. Chapter VI identifies the accession point from which qualified mariners enter the

merchant marine workforce. Chapters II through VI each end in preliminary conclusions regarding that chapter's contents. Chapter VII puts forth the manning requirements for the RRF as it will be configured in the year 2001. This chapter also summarizes the researcher's findings and gives recommendations for ensuring the U.S.'s capability to man the RRF during large scale defense mobilization.

II. A BRIEF HISTORY OF THE RRF

A. CREATION

The Ready Reserve Force (RRF) has not had a very long history compared to the nation's merchant fleet. It was created in 1976 when the Department of Defense (DoD) realized that the only way to guarantee the success of the nation's military strategy — forward deployment and coalition warfare — was to ensure the capability of transporting the necessary equipment and supplies to any point or region of conflict (ROC) around the world.

The RRF was formed from and became a subsection of the existing National Defense Reserve Fleet (NDRF). The NDRF consisted of excess ships from WWII. At the end of the war the U.S. was left with approximately 1900 ships. Some ships were leased to private companies but the majority were deactivated and laid up in shipyards. (Harlow, 17) By placing outmoded WWII Victory cargo ships and a few decommissioned Navy auxiliary vessels in five, ten, and 20 day readiness status, the RRF became a more useful subfleet of the NDRF.

Retained at various ports throughout the U.S. and in Japan, the RRF can be more easily mobilized during wartime. Maintained by the Maritime Administration (MARAD), the RRF

currently consists of 97 ships (see Appendix A). When the RRF is activated, these ships are manned by volunteer civilian merchant mariners who are available and not at sea at the time of activation.

B. THE RRF 1976 - 1989

Between 1976 and 1989 many of the older ships in the RRF were replaced by newer, faster and larger ships. From the 33 original RRF ships in 1976 the fleet had grown to 65 ships by 1985. All activations during this period were conducted for test purposes or exercises only. No more than three ships were ever activated at any one time (see Appendix B, Table B-I). Specific activation procedures for test, exercise, and war purposes will be discussed in Chapter IV.

Manning the RRF between 1976 and 1989 proved uneventful. During test activations, manning was simply a paperwork drill in that lists of names of available mariners were generated but no verification or attempt to contact them was made. With no more than three ships activated at any one time, manning during actual exercises again was of little consequence. At most 100 licensed and unlicensed crew members was required to activate three ships. By taking available mariners from those on (leave) vacation lists, manning the ships was easy. Very few activations lasted more than three months at a time so that manning relief was not required. By the time the mariner reached his maximum

"at-sea time" the ship was being deactivated and no replacement was needed.

Military and political uses of the RRF consisted of sea trials, exercises and DoD cargo lifts. Congress specifically requested only one activation over this period. (Mach and Cavin, B-2) Sea trials test the ships systems and identify problems that cannot be found using dockside tests. Exercises like *Team Spirit 86* utilize the RRF ships to lift DoD cargo in actual joint operations with the Navy and other services. DOD cargo lifts also require fully operational ships and occur in lieu of contracting private companies.

C. THE RRF 1990 - 1993

Activations during the first half of 1990 mirrored previous years in frequency, type, and manning capabilities of the RRF. However, the latter half of 1990 through the first half of 1992 saw the true test of large scale RRF activation capabilities.

On 7 August 1990, the U.S. began to build up forces in the Persian Gulf area in response to the Iraqi invasion of Kuwait. The large quantity of U.S. military equipment and supplies needed to accomplish its mission in the Persian Gulf area called for more shipping capabilities than the commercial shippers and active military vessels could handle. The RRF was called into action. During the initial (surge) period 44 RRF ships were activated. By the end of

the build-up (Desert Shield) a total of 70 RRF ships had been activated. (Rost et al., 3)

This activation was the first large scale activation of the RRF. Manning was accomplished, albeit not as inconsequentially as previous activations, with an average ship operation time of 205 days (see Appendix B, Table B-2). Chapter IV provides more details on manning issues during Desert Shield and Desert Storm.

This nation's participation in the Persian Gulf War brought to light the usefulness of the RRF. Military as well as political decision makers focused on the need for increased sealift capability during wartime. The capability to move by sealift the necessary military equipment and supplies proved to have a major impact on the U.S.'s success in the war. In order to meet the nation's mobility requirements in the future, the U.S. Joint Staff recommended that 19 Roll-On Roll-Off type vessels be added to the RRF. (U.S. MSC, 21) The total number of RRF ships expected in the year 2001 is 140.

D. ADMINISTRATION OF THE RRF

The RRF is administered by MARAD. Funding for MARAD is provided through Department of Transportation (DOT) appropriations. Because of the position the RRF holds within MARAD it is important to note the role of this organization.

MARAD was formed as a result of the Merchant Marine Act of 1936. At that time the U.S. government recognized the merchant marine as a viable asset to the nation. MARAD'S mission is to facilitate a continued viable U.S. merchant marine fleet. At the same time insurance of this nation's continued economic independence and the availability of a merchant fleet for defense purposes is at the core of MARAD's goals.

MARAD has four major avenues available to accomplish its mission of maintaining a viable merchant marine. The avenues are financial incentives, research and development, reserve authority to requisition U.S. flag ships, and labor and training issues.

Financially, MARAD oversees four programs which facilitate shipowners and operators in financing the procurement and operation of American built, American flagged, and American crewed ships. These programs are the operating differential subsidy (ODS), the construction differential subsidy (CDS), Title XI mortgage guarantees (Title XI), and capital construction funds (CCF). The ODS subsidizes operational costs of commercial (privately-owned) ships. The CDS subsidizes the cost to build commercial ships. Title XI guarantees the repayment of loans to buy commercial ships. The CCFs are given to qualified shipowners or prospective shipowners who desire to build

more (newer) ships but who find it difficult to tie up their current capital.

MARAD also participates in research and development geared toward improving the maritime technological base. Research in fuel efficiency and improved ship construction are but a few of their advanced technology initiatives.

MARAD is empowered with reserve powers to requisition U.S. flagged commercial ships for title or use when required. Although this action is authorized, MARAD refrains from exercising its power in this area and attempts first to contract the commercial ships.

Recognizing that nothing moves without human resources MARAD is deeply involved in maritime labor and training. MARAD operates the Kings Point Merchant Marine Academy in Kings Point, NY, (Johnston, F., interview, 1994) and provides financial assistance to train merchant marine officers at six other state-operated maritime academies. MARAD also provides supplemental training for seafarers in maritime firefighting, diesel engineering and defense readiness. It maintains seafaring labor data, grants medals and decorations for exemplary service in national defense actions and keeps abreast of union labor issues.

E. MAINTENANCE AND OPERATION OF THE RRF

MARAD oversees the maintenance as well as the operations of the RRF. Although under the custody of MARAD, MARAD does

not maintain nor operate the RRF ships. Via federal regulations MARAD uses general agents as contract operators. The general agents are civilian companies and have the responsibility for specific ships in their region. They report and answer directly to MARAD. American President Lines, LTD. (APL) is one such general agent. Twelve ships are under their cognizance. During peacetime, APL ensures that the ships and the equipment onboard are maintained in a designated state of readiness. When these ships are reactivated, APL obtains crew members from local union halls and necessary stores for the ship(s) from local businesses.

The extent of maintenance required on a ship depends on the state of readiness MARAD has placed that ship in. The RRF ships under APL's contract are in five day readiness status. "[One of the] core 'Lessons Learned' in the Gulf War [was] the difficulty of activating laid up ships . . ." (APL, 4) Readiness is directly related to the material condition of the ship at the time it is called up for activation.

> The Mobility Requirements Study released in November of 1993 clearly states the requirements for sea lift necessary to support the deployment of a minimum force in a future contingency, and the readiness level for the Ready Reserve Force. The response to this has been the out-porting of the RO/RO ships of the RRF, and the placement of ROS crews on these vessels. The initial program envisioned 10-man ROS crews on these vessels, but the budget to support this manning level has not materialized. Plans to "nest" ships in out-ported locations with a 14-man ROS crew for 2 ships in order to improve capabilities and reduce costs are under review. This policy begs the question; "What is Readiness?"

> A satisfactory level of readiness on a typical steam driven RO/RO manned by an ROS crew is the ability to activate the vessel in four days, and proceed directly to the loading berth on the fifth day. What does it take to accomplish this is the next question? First, the vessel must have been sea or dock trialed within the past year. All ships' deficiencies must be identified and reduced to those capable of being corrected without shipyard level industrial assistance such as dry docking, etc. In order to achieve this level of readiness, continual comprehensive shipboard testing and maintenance of all ships systems must be performed. (APL, 5)

As APL states, money must be provided to fund whatever level of readiness is prescribed. Without appropriate funding, the required ROS manning levels cannot be maintained and thus our fleet will be less ready. "By reducing crew size, the man-hours available to perform the needed level of maintenance is also reduced, resulting in a progressive deterioration of material condition." (APL, 5)

As mentioned above, the general agent is also responsible for crewing the RRF ship upon activation. While researching this thesis topic the author had the opportunity to visit the *Comet* and the *Meteor* (March 1994) as they were beginning a no-notice service activation. APL is the general agent for these two RRF ships. Both are five day readiness ships. The manning of these ships is typical of the manning for the majority of the RRF ships. Table 1 shows the crew list for the *Comet* during this activation. Names have been abbreviated for privacy act reasons.

The Certificate of Inspection (COI) for the *Comet* is shown in Appendix C. The COI is a federally required

document issued by the U.S. Coast Guard. No ship can legally sail without first getting this official document. The COI is good for 2 years and gives specific ship information and limitations. Of concern here is the manning requirements specified. The COI for the *Comet* requires 1 Master, 1 Chiefmate, 1 Secondmate, 1 Thirdmate, 1 Radio Officer, 6 Able Seamen, 3 Ordinary Seamen, 1 Chief Engineer, 1 First Assistant Engineer, 1 Second Assistant Engineer, and 2 Third Assistant Engineers for a total of 19 crew members. The crew list (the number of mariners actually slated to sail) is listed in Table 1 and exceeds the COI manning recommendation. A total of 40 crew members were scheduled to sail on that particular activation.

Activating the RRF occurs for testing purposes (test activation) or when it is determined that commercial and military sealift resources are inadequate (service activation). Test activation evaluates all of the systems in the ship. Problems encountered at the time of the activation are found and repaired. Once the material condition of the ship is evaluated it is deactivated. Service activation is also a way of evaluating the material condition of the ship, but in addition to bringing the ship on-line, the ship accomplishes some type of sealift mission before it is deactivated.

TABLE 1
S.S. COMET
CREW LIST[1]

NAME	ARTICLE[2]	RATING	Z NUMBER[3]
RSS	000	MASTER	ZXXX
SAP	001	CHIEFMATE	ZXXX
KL	002	SECONDMATE	ZXXX
JAP	003	THIRDMATE	ZXXX
DGB	004	THIRDMATE	ZXXX
(unfilled)	005	DECK CADET	XXXX
JMS	006	MREO[4]	ZXXX
JJM	007	BOSUN	ZXXX
TRG	008	A.B.[5]	ZXXX
KHC	009	A.B.	ZXXX
JHM	010	A.B.	ZXXX
GWC	011	A.B.	ZXXX
RAG	012	A.B.	ZXXX
CEG	013	A.B.	ZXXX
ARH	014	O.S.[6]	ZXXX
CAP	015	O.S.	ZXXX
(unfilled)	016	O.S.	ZXXX
JWVH	017	CHIEF ENGINEER	ZXXX
WHM	018	FIRST A/ENG.[7]	ZXXX
TJD	019	SECOND A/ENG.	ZXXX
FCJ	020	THIRD A/ENG.	ZXXX
CGV	021	THIRD A/ENG.	ZXXX
SAD	022	THIRD A/ENG.	ZXXX
(unfilled)	023	ENG. CADET[8]	XXXX
DBM	024	CHIEF ELECT.[9]	ZXXX
JRF	025	ELECT/REEFER[10]	ZXXX
CL	026	OILER	ZXXX
RT	027	OILER	ZXXX
NEV	028	OILER	ZXXX
JDP	029	FWT[11]	ZXXX

TABLE 1 continued			
EC	030	FWT	ZXXX
(unfilled)	031	FWT	ZXXX
DMC	032	WIPER	ZXXX
RVM	033	CHIEF STEWARD	ZXXX
TES	034	CHIEF COOK	ZXXX
CC	035	ASST. CK/GSU[12]	ZXXX
MRG	036	GSU	ZXXX
RAG	037	GSU	ZXXX
(unfilled)	038	GSU	ZXXX
(unfilled)	039	GSU	ZXXX

Legend: 1. Taken from S.S. Comet COI 2. Article number used for lifeboat assignment. 3. Coast Guard document number 4. Radio Officer 5. Able Seaman 6. Ordinary Seaman 7. First Assist. Engineer 8. Engineer Cadet 9. Chief Electrician 10. Electrician/Refrigeration 11. Fireman/Watertender 12. Assist. Cook/Steward

In the event of an actual war the U.S. rapidly deploys forces to the region of conflict to deter enemy aggression. Sealift for this type of immediate deployment is called surge shipping. The immediate nature of surge shipping calls for ships to be available to load at the prescribed port and it calls for ships to be configured to handle the necessary equipment and supplies. The MARAD Emergency Operations Plan presumes that private trade will continue during wartime, that is, as far as possible, with foreign flag ships and the remaining U.S. flag fleet that are not commited to military sealift. (U.S. DOT, 101-4)

Even with the use of commercial ships, however, additional sealift will be needed in a wartime scenario and the RRF will be called out. The ability to immediately fill

crew billets in a large activation means that a very large number of qualified mariners must be available at the time of call-up.

In any wartime contingency the length of the conflict is uncertain. Deployed forces require continued sustainment as long as they are deployed. Therefore, it is vital to be prepared to ensure a continued resupply for the nation's battling forces abroad. The sealift of this continual supply of equipment and supplies is called sustainment shipping. Once activated the RRF ships can make as many trips as needed from the U.S. to the region of conflict and back. But the RRF crew members must be relieved after a certain at-sea time period. The manning issue here is the ability to provide qualified manning relief for the sustained shipping period. The ability of the U.S. to provide this manning relief depends upon the number of qualified mariners not otherwise employed.

F. PRELIMINARY CONCLUSIONS

The U.S. sealift requirements during wartime greatly exceed the capacity of active commercial and miliary ships. The Ready Reserve Fleet of ships provides for this contingency by enhancing the nation's sealift capabilities when needed and allowing the immediate reduction in capability after the RRF has served its purpose.

Unless there is a wartime contingency, the use of the RRF is very minimal. Test activations, although they give a true picture of the material condition of an RRF ship, in no other way exercise the large network of operations required in a full-scale RRF activation. Port facilities are not taxed, logistics are not tested, and of importance in this thesis, manpower activation is usually no more than a paperwork drill. Can the nation adequately man these ships when called upon? Several studies have addressed this question. The next chapter (Chapter III) discusses five historical merchant marine manning studies and their conclusions.

III. MERCHANT MARINE MANNING STUDIES

The ability to man the RRF ships during large scale activation has been a concern for many years. Several studies were conducted over the last 10 to 15 years dealing with the U.S. Merchant Marine. However in many studies the RRF manning issue gets lost in the larger picture concerning the ability to maintain an entire national merchant marine fleet. In those studies where manning was addressed, shortages were found to exist in the overall merchant marine and therefore the RRF as well. Some studies also suggest alternative solutions. Five studies concerning maritime manning are reviewed in the following sections. Two studies deal with the overall merchant marine workforce. Three others deal specifically with RRF manning during mobilization for defense purposes.

A. U.S. MERCHANT MARINE WORKFORCE SUPPLY AND DEMAND ANALYSIS 1979-1988 (MMWSDA)

In December 1979 MARAD issued its fifth study in a continuing series concerning the supply and demand of merchant marine manpower for industry and Government. Based on available historical data and intelligent estimates, this study concluded that a workforce supply shortfall did exist

in 1979 and the trend through 1988 would be a continued increase in those shortages. No specific analysis nor conclusions were made or drawn directly about the RRF in this study. MMWSDA looked at the supply and demand of the maritime workforce by dividing the U.S. maritime industry into four sectors, the commercial deep-sea sector, the Great Lakes sector, the Government sector, and the peripheral sector.

The commercial deep-sea sector consisted of the U.S. flag privately owned deep-sea fleet, 1,000 gross tons and over. The Great Lakes was comprised of those ships operating in the Great Lakes region which were 1,000 gross tons and over. Government sector included the Military Sealift Command's (MSC) civil service fleet and other government vessels. The peripheral sector took into account the existence of a significant number of vessels not usually classified as part of the other three sectors but which require licensed officers. These ships include passenger vessels, research vessels, dredges, coastal or ocean going tow craft, ferries, fishing vessels, and offshore oil and mineral exploration and support vessels.

This study, a very comprehensive one, took into consideration the possibility of spot shortages. Spot shortages occur because mariners do not sail an entire season on a ship. These mariners take time off for vacation, personal business and sick leave. Other factors

like schedule problems also restrict a mariner from sailing during an entire season. Spot shortages are covered by considering that more than one mariner is required per billet. The demand for mariners then becomes a function of the billets available throughout the entire U.S. merchant fleet multiplied by the average number of mariners required to fill the billet during sailing season. Using this "equilibrium men-per-billet ratio" the study achieved a justifiable accuracy in determining the *demand* levels of the four maritime sectors. All billet requirements for the various ship types were based on actual staffing levels recorded by MARAD (December 31, 1978) and on surveys received from numerous vessel operators. The *supply* of mariners was based on those officers who would be able, qualified and available to work as licensed officers aboard U.S. flag vessels.

Table 2 shows the manning demand and supply based on the study's model along with the estimated yearly shortages. All four sections discussed earlier are compiled to yield the indicated yearly shortages for the entire merchant marine industry.

TABLE 2
YEARLY MANNING SHORTAGES
U.S. MERCHANT MARINE INDUSTRY[1]

Year	1978	1980	1982	1984	1986	1988
Expected Shortages	-38	-482	-653	-975	-1113	-1302

Legend: 1. Taken from MMWSDA, 11

B. EFFECTIVE MANNING OF THE U.S. MERCHANT FLEET (EMUSMF)

In an effort to enhance the competitiveness of the U.S. flag fleet, MARAD, in 1983, requested the Marine Board of the National Research Council to study how effective manning practices might improve the U.S. fleet productivity. Substantial productivity gains by European and Asian merchant fleets in the late 70's and early 80's spurned the need for the U.S. fleet to look for ways to remain competitive in the worldwide merchant fleet industry. The productivity gains made in the European and Asian nations were the direct result of the more effective manning practices of these countries. The study was called Effective Manning of the U.S. Merchant Fleet and was conducted by the *Committee on Effective Manning* (COEM). COEM was established to "provide technical background and analysis in support of management, labor, and government decisionmaking regarding the means and process by which effective manning may be best accomplished in the U.S.-flag merchant fleet." (COEM, v) Through interviews, workshops

and literature reviews the COEM addressed issues such as changes aboard ship, changes in the operation of ship operating companies, training, regulatory reform and policy innovations. COEM spent extensive time in Northwest Europe interviewing people from ship operators through government administrators and observing the effective manning practices of those countries. The committee then interviewed people from U.S. ship operators through government administrators and observed the U.S. fleet operations.

In their report the COEM detailed the status and manning of the U.S. merchant fleet. They reviewed training issues, rules and practices governing the manning of U.S. vessels, and the extent of manning innovation in the U.S. fleet.

The status of the merchant fleet is characterized by a long-term decline in shipping tonnage (see Table 3). "By 1981, the U.S. merchant fleet had dropped to eleventh place [worldwide], with 578 ships representing 2.3 percent of world vessels." (COEM, 9) Although improved technology which increased carrying capacity of ships can be one explanation for the decrease in number of ships, it is not the sole reason and this would not explain the reduction in dry cargo dead weight tonnage (DWT).

Manning in the U.S. merchant fleet had also declined (see Table 3). Again advanced technology had also decreased crew size, but it alone could not explain the large decrease in U.S. seagoing billets.

TABLE 3
U.S. MERCHANT FLEET 1970-1983[1]

YEAR	DRY CARGO SHIPS	CAPACITY (DWT)	TANKER SHIPS	CAPACITY (DWT)	EMPLOYMENT
1970	1479	15.44	301	7.83	3,872
1975	612	8.17	279	9.43	2,111
1980	553	7.87	310	16.10	2,018
1983	308	6.64	233	14.22	1,936

Legend: 1. Taken from COEM, p. 11

COEM also pointed out the state of the art technology of maritime training facilities in the U.S. However, "It is indicative of the general state of the maritime industry in the United States that only 14 to 50 percent of the 1983 graduating classes of the maritime academies sailed as officers in the merchant marine upon graduation." (COEM, 26)

On the issue of rules and practices governing the manning of U.S. vessels, the COEM provides an extensive review of the frequently vague and even more frequently ambiguous statutes imposed in manning U.S. vessels.

The study concluded that to effectively man the U.S. merchant fleet several new practices would have to be employed. ". . . innovations [are required] in the crewing of merchant vessels, including number of personnel and functional organization, to improve cost-effectiveness, the human environment of the workplace, and safety." (COEM, 1)

In addition, "supporting innovations in vessel design and operating technology, the management structure and operating practices of ship operating companies, the policies and practices of labor unions, government regulations and programs, and the structure and process of collective bargaining [are needed]." (COEM, 1)

This study did not deal specifically with manning the RRF. However its practical evaluation of the U.S. merchant marine industry as compared to the successful effective manning practices of the European and Asian industries clearly sets the stage for the environment in which the RRF lies. In any effort to improve the capabilities of manning the RRF, a look at the manning practices of the fleet from which that resource is drawn is important.

The COEM made recommendations on how specific innovations might take place in the U.S. merchant fleet industry. (COEM, 4-6) The COEM stated that changes must take place on two levels. The industry/institutional level and the company/union level must embrace the idea of the need for change and cooperate in the implementation of that change.

C. COMMISSION ON MERCHANT MARINE AND DEFENSE (CMMD)

In 1984 Congress recognized a need to seriously consider the posture of the United States Merchant Marine Force as it relates to the defense of our country. On October 19th of

that year Congress passed Public Law 98-525 establishing *The Commission on Merchant Marine and Defense*. This commission was tasked to study:

> ...problems relating to transportation of cargo and personnel for national defense purposes in time of war or national emergency, the capability of the United States merchant marine to meet the need for such transportation and the adequacy of the shipbuilding mobilization base of the United States to meet the needs of naval and merchant ship construction in time of war or national emergency. [Then to] make such specific recommendation, including recommendations for legislative action, action by the executive branch, and action by the private sector, as the Commission considers appropriate to foster and maintain a United States merchant marine capable of meeting national security requirements. (CMMD 1988, 5)

Constituted on 3 December 1986, the commission held extensive hearings during 1987 and 1988 and published its findings in four reports. The third report was comprehensive, covering all pertinent areas that the commission considered during its tenure. The findings of fact and conclusions section summarizes the commission's assessment of the maritime industry capabilities, makes recommendations for action by executive and legislative branches of government as well as the private sector. Finally, it puts forth a costs and benefits analysis of implementing the discussed recommendations.

The reports of the CMMD also included studies on the ability to adequately man the RRF. Much attention was given to maritime labor issues during the hearings but very few recommendations were made regarding solutions to ensure that

the labor force requirement would be met during wartime or times of national emergencies. The Commission's analysis shows that, without decisive and effective action, the number of qualified seamen will be further reduced to one-half of the 1988 level by the year 2000. Table 4 shows the actual number of mariner seagoing jobs (billets) in 1988. At that time there was a shortfall of 2,511 personnel to man the U.S. merchant fleet. The CMMD predicts that in the year 2000 there will be 9,627 seagoing billets with a shortfall of 12,213. The commission proposed a goal of 14,847 U.S. merchant marine jobs available in the year 2000 with a shortfall of only 2,817 mariners. "The crewing shortage in 1988 [shown in the Table 4] exists only for radio officers and unlicensed deck and engine personnel; the expected crewing shortage in the year 2000 exists in all licensed and unlicensed categories." (CMMD, 20)

TABLE 4
MOBILIZATION MANNING REQUIREMENTS AND CAPABILITIES[1]

Year	1988 Actual	2000 Predicted	2000 Goal
Commercial and Reserve Billets	14,200	9,627	14,847
Total Shortfall of Merchant Seamen	2,511	12,213	2,817
Legend: 1. Taken from CMMD, p.20			

The commission listed the following findings of fact in their report concerning the RRF:

> By the year 2000, the US merchant marine workforce will be insufficient, both in numbers and in skills, to man, operate, and deploy the ships, whose reliability may be increasingly suspect because of age and material condition.
>
> The [new] ships should be militarily useful, [and] manned by US crews. The challenge to reverse the decline of the AM [American] maritime industries lies with management and labor of the industries themselves, who must be encouraged and challenged to join with the government to address the nation's maritime problem.
>
> Business and labor cannot and should not be allowed to rely on GOVT for unconditional assistance or guaranteed profit, but rather, should view the relationship as a cooperative effort to address a situation of great importance to the nation's security as well as to the industries themselves. They must cooperate.
>
> To provide for the availability of sufficient trained personnel to man sealift ships in time of war or national emergency there is a need to support and preserve the capability to train licensed and unlicensed personnel in the federal, state and industry-labor training facilities.
>
> There is a continuing loss of trained, qualified merchant seamen needed for strategic sealift in time of war or national emergency. There are enough seamen in terms of total numbers to man the existing active commercial, RRF, and MSC Reduced Operating Status (ROS) ships, but small shortfalls exist in the specific skill categories of radio officers and unlicensed deck and engine personnel.
>
> If there were enough ships from whatever source to meet the total strategic sealift and economic support requirements, there could be a short fall of 2511 skilled seamen.
>
> By the year 2000 the number of American seamen actively sailing will have declined by more than 56%. Fleet and mobilization manning profile indicates that active mariners would be insufficient to man the currently projected mobilization fleets including the 133 ships of the RRF.
>
> Mobilization manning in the yr 2000 will encounter shortfalls in six categories of licensed and unlicensed mariners.By the year 2000 the vast majority of today's experienced merchant seamen will be over 65 years old. They only know the older ship technologies (steam) not today's (diesel) propulsion.

Industry union schools are consolidating and operating at minimal levels. (CMMD, pg. 33)

The commission wrapped up its two years of laborious work into seven major recommendations subdivided into 24 specific recommendations. Only one recommendation related to the labor/workforce issue. It stated that Congress should enact legislation which provides a meaningful operating differential subsidy (ODS). ODS as defined in Chapter II subsidizes the operational costs of commercial ships because labor costs are part of the costs in ship operations. By subsidizing the shipowner for a portion of its labor costs, this recommendation attempts to reduce the high labor cost burden of the shipowner while at the same time maintain the U.S. maritime workforce.

There is no specific recommendation to deal with any of the other workforce-related issues discussed during the commission's two year span. No solutions were proposed to handle the mean aging of the seamen or the inability to adequately fill necessary billets.

D. CREWING THE MERCHANT MARINE FOR MOBILIZATION (CMMM)

This study was performed by Presearch Incorporated at the request of MARAD. Completed in January 1991, it proposed to determined methods to achieve adequate manning of merchant vessels during mobilization for war or national emergency. In accomplishing this task, the study 1)

reviewed the U.S. maritime problem 2) reviewed previous manning studies 3) determined manpower shortages for the 1990, 1995, and 2000 timeframe and 5) determined solutions to increase seafarer availability.

Using "men-per-billet ratio" as discussed in section A of this chapter and other available data from MARAD, this study forecasted manning shortfalls as depicted in Table 5. The availability percentage (90%) used in this table assumes that not all qualified mariners (100%) would be able to serve. Although not shown in Table 5, the CMMM study also considered mobilization shortages with 80%, 70%, 60%, and 50% availability of qualified mariners. (CMMM, IV-9) With fewer available mariners, the shortfalls only increase.

TABLE 5
MOBILIZATION AVAILABILITY, REQUIREMENTS, AND SHORTAGES[1]

	1990	1995	2000
Availability (90%)	21,815[2]	15,241	9,736
Requirements Surge/ Sustainment	14,484/23,864	13,597/21,980	11,339/17,009
Shortage Surge/ Sustainment	0/2,049	0/6,739	1,603/7,273
Legend: 1. Taken from CMMD, p. ii 2. Represents manning numbers			

The MMWSDA Study, discussed above, used various equilibrium men-per-billet ratios for the four different

sectors. For example, manning of the U.S. flag deep-sea fleet was established using a 1.93 ratio for both deck officers and engineers. In contrast, this CMMM Study considered mobilization manning requirements for active U.S. flag vessels and the RRF/ROS fleet. A men-per-billet ratio of 1.0 was used for surge requirements and a 1.5 ratio for sustainment. The difference between surge and sustainment shipping, as covered in Chapter II, centers on the immediacy of the shipping and the use of the ships in resupplying the forces. With surge shipping the manpower need is immediate but of limited duration. As sustainment shipping requirements evolve, the manpower needs becomes less immediate but there is an increased number of seamen needed to relieve those at sea.

Unlike any of the other studies covered in this chapter, CMMM specifically sought to determine those methods which are available to achieve adequate manning of merchant vessels during mobilization. The solutions developed in the CMMM study are presented in Table 6. The solutions are annotated as either those that increase the availability of mariners to man the RRF or those that reduce RRF mobilization manning requirements. Appendix D further explains these solutions.

TABLE 6 SOLUTIONS DEVELOPED BY CMMM STUDY
PRIOR TO MOBILIZATION
1 - U.S. Maritime Service Reserve Option A (A)
1 - U.S. Maritime Service Reserve Option D (A)
2 - Convert domestic waterway mariners to deep-sea profession (A)
2 - Convert former military/maritime personnel to deep-sea profession (A)
2 - Implement Mariner Tracking System (A)
2 - Shipping company initiatives to reduce requirements (R)
2 - U.S. Maritime Service Reserve Option B (A)
2- U.S. Maritime Service Reserve Option C (A)
3 - Institute Merchant Marine draft (A)
3 - U.S. Naval Reserve RRF manning (R)
3 - Provide RRF caretaker crews (R)
4 - Convert general industrial personnel to deep-sea professions (A)
START OF MOBILIZATION
1 - Change government regulations to reduce requirements (R)
1 - Change Government regulations to increase availability (A)
1 - Immediate examinations for maritime academy students (A)
2 - Reduced RRF manning (R)
2 - Civil Service mariner manning of surge billets (A)
AFTER MOBILIZATION STARTS
2 - Accelerate training at maritime academies and union schools (A)
Legend: Numbers indicate recommended priority for implementation. (A) indicates the solution increases seafarer availability. (R) indicates the solution reduces mobilization requirements.

E. MOBILITY REQUIREMENTS STUDY (MRS)

In FY91, due to increased Congressional interest in Department of Defense (DoD) mobility resources, Congress directed the DoD, as part of the National Defense Appropriations Act, to conduct a study to determine future mobility requirements and to develop an integrated plan for implementation. This study, the Mobility Requirements Study (MRS), was a comprehensive review of all aspects of mobility — intertheater, intratheater and CONUS — and included sealift, airlift, amphibious lift, surface transportation and prepositioning requirements.

The MRS considered various threats, warning time, probability of allied participation, overseas bases, access to overseas facilities, available commercial shipping, preservation of the U.S. maritime industry, and lessons learned from Desert Shield/Storm (DSS). Additionally, recommendations had to be realistically budget constrained. The study was conducted utilizing wargaming, with the various scenarios set in 1999.

Volume I of the MRS, released in January 1992, provided the 1999 sealift requirement and projected strategic sealift shortfalls. It outlined a plan to increase lift assets over the next several years but did not discuss ways of ensuring adequate manning capabilities. Of relevance in this thesis is its accepted recommendation of increasing the RRF by adding 19 additional Roll On Roll Off (RO/RO) type vessels.

F. PRELIMINARY CONCLUSIONS

The five studies discussed in this chapter all agreed that there is a declining trend in the number of U.S. seagoing billets. In addition they agreed that if this trend continues there would be a manpower shortage in the merchant marine workforce.

Although the MMWSDA suggested a manpower shortage of 1,302 in the year 1988, research did not uncover any report of industry manning shortages in that year. This could be accounted for by the fact that all government vessels were included in that study but were not all utilized that year. As Appendix B shows, only a small percent of government NDRF ships were activated in 1988. The CMMD showed an actual 1988 shortfall of 2,511. Using previous studies, the CMMM study provides no data for 1988 but predicted a 1990 manning shortage of 2,049 for sustainment shipping during mobilization for defense. It also forecasted shortages of 1,603 and 7,273 in the year 2000 for surge and sustainment shipping, respectively. The MRS and the EMUSMF studies did not forecast numerical shortages in manpower but brought to light pertinent issues for manning the RRF.

Based on the MRS, the RRF will increase by 19 ships by the year 2000. This decision to increase the RRF adds approximately 575 billet requirements to the already difficult manning task. The number 575 is calculated using

the average current RO/RO manning requirement of 30 taken from the CMMM study. (CMMM, B1-B8)

The EMUSMF study does an interesting job in linking RRF manning to the real challenges of the U.S. shipping industry. The practices of the private shipping companies, federal regulations imposed on those companies, and union influences have created an intricately complicated structure that is cumbersome, uninviting to prospective employees, and resistant to change.

The CMMM study makes a major point that RRF manning shortages occur only with sustainment shipping during large scale mobilization. Will the RRF be able to handle sustainment shipping? When the RRF is called upon what procedure is in place to get the ships and cargo to the region of conflict on time? Chapter IV covers these issues.

IV. RRF MANNING PROCEDURES

This chapter examines the procedures in place to recall mariners when needed to reactivate Ready Reserve Force (RRF) ships. A review of the types of ships within the RRF fleet of ships and their readiness condition are first looked at. The call up procedure is then discussed. This procedure involves more than simply hiring people to man the ships. The number of RRF ships activated at any one time, the length of activation, and the mix of maritime skills levels, have a bearing on the ability to adequately man the ships. The utilization of the RRF in Operation Desert Shield/Storm (DSS) is an adequate example of the intricate nature of RRF reactivation. DSS is discussed along with the effect that a large-scale reactivation has on commercial shipping operations. A preliminary conclusions section regarding all of these issues ends this chapter.

A. SHIPS IN THE RRF

The RRF is made up of 10 basic ship types. They are Breakbulk, Tanker, Roll On Roll Off (RO/RO), Lighter Aboard Ship (LASH), Sea Barge (SEABEE), Seatrain, Fast Sealift Ship (FSS), Crane, Troop, and Aviation Support. Appendix A lists the 97 ships currently in the RRF. Ship type is given along

with its geographic location. Each ship is maintained by a commercial shipping company (general agent or ship manager).

As discussed in Chapter II, the readiness level is the ability of the ship to be activated for service within a specified period of time. Actual readiness is inherently determined by the condition of the ship. "It is no surprise that the better the condition of the vessel at the time of breakout, the easier it is to activate." (Kessler, 76) A historical review of the activation condition of 12 RRF ships was done by Lieutenant Phillip R. Kessler in 1991. Of the 12, the activations that were more successful and timely were those in which the ship had been recently activated. "[The condition of a recently activated ship is much better] than one that has been in lay-up for as long as five years." (Kessler, 78) Of the current 97 RRF ships, 70 were activated during DSS. At least 70 of the ships, then, are in generally good condition at this point and will be more easily activated at least through 1996 (five years after DSS activation).

To ready a vessel, a limited and specialized crew is required. An even larger crew is needed to operate the ship for service. Manpower is essential in activating as well as operating a ship. Procedures in place to man the RRF are discussed later in this chapter.

B. STEPS TO ACTIVATION

A cursory look at the total reactivation procedure is presented in Table 7. This step by step listing of the required actions by Commander, Military Sealift Command (COMSC), Secretary of the Navy (SECNAV), Military Sealift Command (MSC), and Chief of Naval Operations (CNO), however, does not cover the complicated actions and interactions that must occur to operate the fleet of RRF ships.

TABLE 7
Steps for RRF Activation[1]

Step 1. COMSC (Acting as executive agent for SECNAV) decides additional shipping capability is required
Step 2. MSC informs CNO Strategic Sealift Division (OP-42) of need to activate RRF vessels.
Step 3. OP-42 obtains activation approval and funding from SECNAV
Step 4. CNO directs MSC to activate particular ships[2]
Step 5. MSC informs MARAD of dates the ship(s) are required
Step 6. MARAD informs contract operators to begin the activation procedures
Step 7. Upon activation MSC receives administrative control of the ship(s) and the fleet commander receives operational control.

1. Taken from Tryon, 5-6 2. In a crisis, the specific RRF resource requirements would depend upon the particular OPLAN in effect, as determined by MSC.

C. STEPS TO MAN RRF SHIPS

As mentioned above, the Maritime Administration (MARAD) administers the RRF, but maintenance and operations are performed under contract. Once the contract operators

notify the mariner unions that manning is required for activation, the unions contact individual mariners to fill the billets on each ship. Manning one, two, or three ships for operation is generally a simple matter. The problem arises when one geographical area requires crews for a large number of RRF ships.

Certain ships require specific skills. A tanker such as the *SS Shoshone* requires one (1) Third Mate, no (0) electricians, no (0) firemen/watertender (fwt's), one (1) pumpman, and one (1) Deck, Engine Mechanic (DMAC). Whereas a dry cargo ship, like the *SS Lake,* calls for two (2) Third Mates, one (1) electrician, three (3) fwt's, no (0) pumpmen, and no (0) DMAC's. It is not enough for the unions to send bodies, but to send those potential crew members that are qualified for the needed billets and who have current, valid licenses and experience in that particular type of ship. It is well known that operating a steam ship calls for different skills and knowledge than operating a diesel ship.

In the past, unions have responded to the nation's call for emergency manning with urgency. Although an exacting job (of providing the right mix of skilled mariners), the unions came through with adequate manning for the Vietnam War as well as DSS. Several issues are dealt with on the union level to ensure that the dwindling number of mariners available to man the RRF are contacted and utilized as expediently as possible.

A list of probable union initiatives at time of mobilization..[include]:
-Put aside labor and management disputes to allow military sealift operations.
-Relax contractual manning levels to USCG minimum levels.
-Amend retirement rules to allow retired personnel to return to active service. It is noted that most unions do not have a mandatory retirement age.
-Expand union educational training activities to upgrade current personnel and add new personnel.
-Relax work rules to make allowance for substandard accommodations on some RRF vessels. (CMMM, V-18)

D. RRF ACTIVATION FOR DESERT SHIELD/STORM

On 2 August 1990, Iraq invaded Kuwait and, by that action, threatened neighboring Saudi Arabia. In response, on 7 August, the United States began Operation Desert Shield to build up forces, principally in Saudi Arabia and surrounding waters. Phase I of the operation, which ended in November, was designed to deter further Iraqi offensives. During that phase the services moved over four Army divisions, a Marine Expeditionary Force, approximately 1,000 combat aircraft, and 60 Navy ships to the theater-a force of some 240,000 personnel. Phase II began on 7 November and provided the offensive power needed to dislodge Iraqi forces from Kuwait. During this phase, U.S. forces more than doubled. (Rost et. al., 1)

Orders to activate the RRF began three days after the start of Operation Desert Shield. Initially 18 RRF ships were called up. Appendix B lists the RRF ships' activation sequence for DSS. Only 25 percent (12 out of 44) of the ships initially activated were on schedule. During the second call up, only 12 percent (3 out of 26) were on time. (Rost et. al., 29) This tardiness *seems* to have allowed the unions one to six days more time in filling necessary billets. The delayed activations, however, were due to

maintenance problems and not lack of manning. The CMMM study has stated that with the current level of qualified mariners at 100 percent, and even 90 percent availability, surge shipping does NOT pose a manning problem. It is in the sustainment shipping, where current crew members must be relieved, that the manning shortage is felt. One general agent for the RRF stated "we were able to find relief manning for the initial RRF crews, but at the point of filling relief billets, we were hardpressed to find those with the necessary qualifications." (Childs, interview)

Manning of U.S. commercial shipping is provided by mariner unions also. Due to the routine and scheduled routes of commercial shippers, many of their crew members are utilized on a permanent hire contractual basis with the commercial shippers. These permanent crew members retained their positions on commercial ships and were not affected (reassigned) for the RRF activation. This suggests that manning of U.S. commercial shipping was not affected by the Desert Shield/Storm (DSS) RRF mobilization.

E. PRELIMINARY CONCLUSIONS

Three main issues dealing with RRF manning are 1) the ability to man for a large RRF mobilization, 2) the ability to man for longer periods of time and 3) the ability to man quickly.

The large-scale call-up of ships for DSS gives us a good idea of what effect large scale activation has on the ability to crew RRF ships. Again, the problem is not with immediate manning capability at the time of mobilization. Given 90% availability there are adequate numbers of mariners to man the current RRF ships. The ability to man for longer periods of time is a pertinent issue. DSS lasted approximately six months. There are indications that suggest that a longer utilization of the RRF ships might be problematic due to manning shortages.

The DoD has put forth a "win-hold-win" strategy as a feasible reaction to at most two concurrent world conflicts that the U.S. may be involved in in the future. For the one, short DSS contingency, 70 ships were activated. A total of 140 ships is expected to make up the RRF by the year 2000. This number includes the 19 additional Large Medium Speed Roll On Roll Off Vessels suggested by the MRS. If the nation is involved in conflicts after the year 2000 and they continue with their plan of having 140 RRF ships available, they will have 70 additional ships to draw from if the need arises. Even at 100% availability of mariners, the CMMM study reports that a declining trend in seafaring manpower will result in a substantial manning shortage to crew RRF required billets in the year 2001. (CMMM, IV-8)

V. READY RESERVE FORCE (RRF) SKILL LEVELS

Federal regulations govern the crewing of U.S. flagged ships of which the RRF is a part. These regulations require some crew members to have specific licenses to operate the vessels. Different types of vessels need different licensed and unlicensed skill levels. Some ships require more of one skilled crew type than another. Other skills, such as steward, require little or no special training to perform their duties aboard ship.

Advanced ship technologies also have an impact on the type of skills needed and the number of crew members required onboard ships. Structural improvements have eliminated the need for many of the skills required on the older ships.

The skills used in the fishing industry and the Great Lakes shipping industry are different from those used in deep-sea vessels like the RRF. But are they so different that these skill levels should not be considered as sources of RRF manning during mobilization for defense?

This chapter will discuss the skill levels required for RRF ships, mariner licensing, and how government regulations and advanced ship technology affect manning. Also included is the suitability of fishing industry and Great Lakes shipping industry personnel for RRF manning.

A. MARITIME MANNING POLICIES

Maritime manning regulations were established primarily to ensure safety aboard ships. These regulations, administered by the United States Coast Guard (USCG), specify the skill level and quantity of crew members required before a ship can sail.

The Certificate of Inspection (COI), discussed in Chapter II, is an official document required by federal regulations for all U.S. flagged ships. (see Appendix C) The USCG marine inspection officer issues this document for the ship only after a thorough inspection of the vessel. Some of the inspection categories include hull exams, stability, fuel tanks, boilers/steam piping, pressure vessels, tailshaft and lifesaving. Another inspection category, which is significant to this thesis, is the Vessel Manning Requirement for licensed and unlicensed personnel. This category not only specifies skill levels required, but the number of crew members of that particular skill needed to man a certain ship. The vessel manning requirement category includes the skill levels listed in Table 8. "The ratings of 'deck engine mechanic,' 'engineering' and 'junior engineer' [are other possible skills, but] are not required on the Certificate of Inspection (COI)." (NRC, 153)

The number of crew members of a designated skill level is not arbitrarily set. It is based on federal regulations adopted with regard to vessel type (steam or gas turbine),

size (in gross tons), the ship's mission (tanker, dry cargo, etc.), and its area of operations (inland waters, deep-sea, etc.).

TABLE 8
VESSEL MANNING SKILLS[1]

Master	Able Seaman	Third Engineer
Chief Mate	Ordinary Seaman	Fireman
Second Mate	Deckhand	Oiler
Third Mate	Chief Engineer	Tankerman
First Pilot	First Engineer	Lifeboatman
Radio Officer	Second Engineer	
Others:	Passengers	Other Crew

[1] Taken from COI form

The rules and regulations governing ship crewing, however, were promulgated separately from and in many times without regard to technological advancements or previously promulgated mandates. For example, a more modern diesel ship with electronic gauges and sensors located on the bridge of the ship do not have to have 24 hour watchstanders in the engine room. However, the 46 U.S.C. 8104 (a federal regulation) requires that a master establish watches for licensed individuals. "These crew members shall be divided into at least three watches and be kept on duty successively to perform ordinary work incident to the operation and management of the vessel." (NRC, 151)

> The current statutory and regulatory regime for vessel manning suffers from several deficiencies that cannot be overcome by administrative innovations. They are at once both too broad and too rigid. The manning code, despite the 1983 recodification, is mostly a conglomeration of disjointed legislative responses to spasmatic maritime disturbances throughout this century. It provides no overall objective that the Coast Guard is expected to pursue in administering the statutes. On the other hand, the individual provisions tend to focus too narrowly on discrete facets of the manning picture. Their rigidity deprives shipowners, masters, and seamen of the flexibility needed to develop a prosperous merchant fleet. (NRC, 141)

The EMUSF study discussed in Chapter III also cited how the rigid, and in many cases, vague statutes and rules affect manning efficiency onboard U.S. ships. Manning the RRF must be accomplished, nevertheless, within this inflexible regulatory environment.

B. RRF SUPPLEMENTAL CREWING

Chapter IV listed the ten ship types currently within the RRF. Table 9 gives manning requirements for each of these ship types based on COI minimum manning levels. The COI, because it specifically addresses safety issues, does not include the stewards necessary to support the crew, nor the special cargo crews needed on those ships configured for underway replenishment (UNREP). This table, modified from the CMMM study, includes those additional special and support crew members. The reduced manning column uses the COI minimum manning number and adds three to six additional crew for steward duties. The full complement of special

cargo crew for the ships with UNREP capabilities is also included in the reduced manning column.

TABLE 9
CREWING FOR RRF SHIPS[1]

Ship Type	COI Minimum Manning	Special Cargo Crew	Reduced Manning
BB	24	0	27
BB/Container	21	0	24
BB/UNREP	24	36	60[2]
Tanker	21[avg]	0	24[avg]
FSS	24	0	28
RO/RO	21	0	24
LASH	18	0	21
Seabee	21	0	24
Seatrain	24	0	27
FSS	24	0	28
Crane	28[avg]	0	34[avg]
Troop	24	0	37
Aviation Support	21	0	24

Legend: [1] Taken from CMMM, p. B3-B8 [2] Reduced Manning includes a complement for Special Cargo Crews. ([avg]) indicates the average number of crew required for that particular ship type and variations of that ship type.

The special cargo crew is generally made up of additional bosuns, able bodied seamen, general utility men, third mates, third assistant engineers, and Qualified Members of Engine Department (QMEDs). This supplemental crew, as indicated above, serve during ship to ship UNREP

operations. UNREPing is the act of transferring goods and cargo from one ship to another while underway (while sailing). This is a very dangerous operation and requires experienced personnel. Generally, military crew are used for this purpose aboard the RRF ships. Civilian mariners generally do not possess these skills unless they have prior military service.

UNREP skills are not the only ones in which civilian mariners lack experience. Increasingly, more commercial ships are requiring fewer of the skills needed on the RRF ships. This effect, caused by the more advanced technology of the commercial fleet, is discussed in the next section.

C. IMPACT OF ADVANCED TECHNOLOGY

Changes in ship construction and operations have affected the number of crew members and skill types required to operate commercial ships. More measured tons (MTONs) per ship are now being carried than 40 years ago. Ships are now larger. The older breakbulk ships average 51,485 square feet of cargo space compared to the 131,801 square feet on a RO/RO/Container ship. Simple calculations show that three breakbulk ships would be required to carry the same load as one RO/RO/Container ship. Comparing the manning requirements from Table 9, it is apparent that in utilizing the more technologically advanced RO/RO/Container ship, there is an immediate decrease in required manning (for the

same 131,801 square feet of cargo). With reduced manning, the breakbulk requires 27 crew per ship (81 total). Using one RO/RO/Container ship requires 24 crew members, and hence 54 less crew members to move the same amount of cargo. (MTMCTEA, 29)

Diesel propulsion engine rooms on the more modern commercial ships can be monitored and operated electronically from the bridge. Older RRF ships are steam driven and require constant monitoring and adjustments on the spot. With the increase in the number of commercial diesel ships, finding mariners experienced and knowledgeable with steam engine ships is becoming more difficult. Of the 70 RRF ships utilized during DSS, 59 were steam propulsion. (Rost, et al., B-3)

Although ship enlargements and engine room modifications have reduced the overall number of mariners needed, other skill levels have also been affected by advanced technology. Ship loading/unloading skills are changing. Many older ships have their own loading/unloading equipment (these ships are called self-sustaining). Newer ships do not have this capability, and many current mariners have not had sufficient experience to handle this type of equipment.

D. LICENSURE

The USCG administers the licensing of all U.S. mariners. Excerpts from the licensing guides for unlimited masters and mates, engineer officers, and certain qualified ratings is included as Appendices E through G. These guides present an overview of the application procedure, and service and examination requirements that must be satisfied before a license may be issued. (USCG, MSO, 3)

> Under the authority of title 46 U.S. Code, the U.S. Coast Guard promulgates the requirements for the licensing of mariners. These regulatory requirements are found in Title 46 Code of federal Regulations, Part 10. Nearly sixty different licenses or certificates are provided for. Each license has qualifying requirements as to age, citizenship, physical condition, character, qualifying sea service, and specialized training. Licenses when issued, may contain restrictions as to vessel type, tonnage, means of propulsion, horsepower, or waters upon which service is authorized. (USCG, MSO, 3)

There are no licenses issued or required for ordinary seamen, wipers, or steward personnel. However there are some restrictions. Citizenship must be verified and there are minimum age levels set.

The Qualified Member of the Engine Department (QMED) licensure requires proof of experience in vessels at least 100 gross tons, proof of U.S. citizentry or resident alien. Minimum age levels and minimum physical condition are also set. In addition, the QMED applicant must successfully complete examination modules in their desired rating. QMED ratings may include:

- Fireman/Watertender
- Oiler
- Refrigerating engineer
- Electrician
- Deck Engineer
- Pumpman
- Machinist
- Junior Engineer
- Engineman
- Deck Engineer Mechanic

Licensure requirements for other skill levels are included in Appendix E.

Masters and Mates licensing have the same type of general requirements as QMEDs. However, applicants must be U.S. citizens. They must prove that they have previous experience in certain areas. Successful completion of of masters and mates exam modules is also required. In addition, formal training must be documented.

Engineer Officer licenses mirror masters and mates with special engineering training and experience and successful completion of test modules.

It is noted that within these skills and ratings, there are additional promotion opportunities which require even more stringent specified experience and testing.

E. SKILL LEVELS FOR INLAND WATER OPERATIONS

Ship engineers operating in inland waters are generally not licensed for deep sea operations. The same goes for pilots, mates, and captains operating in other than deep sea vessels. Mariners in the fishing industry also are generally not licensed to work on RRF ships. The skills required for inland waters and the fishing industry are not the same as deep-sea operations. Licenses are issued under the designations: inland waters, near coastal, Great Lakes, fishing and towing, and mobile offshore drilling unit (MODU). There is, however, a possibility that inland waters and fishing industry personnel can be utilized to crew the RRF during war or national emergency. The CMMM study considered the effect on RRF manning if these additional licensed personnel were permitted to serve onboard RRF ships. "Many of these mariners [domestic mariners] could be readily converted from their present shipboard positions to those on mobilization assets." (CMMM, VII-1) Table 10 is taken from the CMMM study. It shows the number of qualified mariners working on the inland waterways (1988).

The CMMM study also included information on 1988 issuance of Near Coastal Licenses, Great Lakes and Inland Licenses, Fishing and Towing Industry Licenses, Mobile Offshore Drilling Unit (MODU) Licenses, and Uninspected passenger Vessel Licenses. A total of 22,156 license issues and renewals were reported for the 1988 year.

TABLE 10 INLAND WATERWAYS PERSONNEL ALL CATEGORIES[1]	
OCCUPATION	NUMBER
Captain	8610
Mates	4470
Pilots	1780
Able Seamen	5640
Ordinary Seamen/Oilers	8890
Ship Engineers	2040
Fishing	120
Food Service	3300
Motorboat Ops	1020
Radio Operator	90
Plant Workers	60
All Others	670
Total	36690

[1] Taken from CMMM, p. VII-3

These domestic mariner pools exist; however, the degree of their usage aboard mobilization assets is uncertain … As a long term solution, at least some of these personnel are potential unlicensed mobilization crewmen. Training would be required and perhaps sea time would need to be waived in some cases. (CMMM, VII-13)

F. PRELIMINARY CONCLUSIONS

To ensure safety aboard ship, federal statutes and rules are put in place and administered by the USCG. Many of these rules have not adjusted to the changes in technology aboard ship. They place shipowners in a position where they must operate their vessels in a less than efficient manner. Maritime labor unions are not pressed to try to change the matter due to the number of billets they might lose in the process. This environment, along with the decreasing number of mariners that are experienced in the operations of older ships, has an effect on the ability to man RRF ships effectively and efficiently.

The possibility of manning the RRF during mobilization using other "domestic" licensed personnel such as those from inland waters and the fishing industry has been studied. If these people were utilized they would not be immediately available to serve due to additional training requirements. But such a large number of potential mariners to man the RRF must not be overlooked.

The additional training requirements needed for the "domestic" licensed personnel to sail RRF ships leads to a discussion of the training requirements of RRF licensed crew and the accession points from which they arise. The next chapter gives an overview of the accession points from which qualified mariners come and the training required for licensure.

VI. ACCESSION POINTS FOR MERCHANT MARINERS

This chapter will examine the various points from which our merchant mariners arise. As previously mentioned, the federal merchant marine academy is one point of accession. Others include the six state-run merchant marine academies, union schools, and former military service members. Many of the skills required, like engineer and deck officer are obtained through formal training at these institutions. Ordinary seamen, as mentioned in Chapter V, do not require any formal training or examinations. Able bodied seamen also require no formal training but must have at least 180 days experience onboard an ocean going vessel and pass a written exam. (see Appendix E)

A. FEDERAL MERCHANT MARINE ACADEMY

There is one federal merchant marine training facility in the U.S. It is the U.S. Merchant Marine Academy at Kings Point, New York. Candidates for this program must be nominated by members of Congress. In an effort to recruit candidates, the Amoco Foundation and the U.S. Merchant Marine Academy have jointly activated a recruitment program in the Chicago, Illinois, area. School counselors encourage the high school students to consider a career in the

maritime industry and Amoco assures future employment opportunities for those students.

Graduates of the academy incur obligations to serve five years in the U.S. Merchant Marine or in maritime related jobs. They must retain a reserve commission for eight years and renew their five year Coast Guard licenses at least once after graduation. (MARAD, 47)

Of those individuals graduating from the academy between 1975 and 1990, 1,110 were reportedly working ashore in 1990. (CMMM, VII-12) Using the 169 graduates of the 1991 class, as a low estimate of yearly alumni, there would be 2,535 total individuals graduating during that 15 year period. The 1,110 career mariners mentioned above, then, represents about 44 percent of the total graduates over these 15 years working ashore.

B. STATE MERCHANT MARINE ACADEMIES

There are six State maritime academies throughout the U.S. They are:

- California Maritime Academy — Vallejo, California
- Great Lakes Maritime Academy — Traverse City, Michigan
- Maine Maritime Academy — Castive, Maine
- Massachusetts Maritime Academy — Buzzards Bay, Massachusetts
- State University of New York Maritime College — Ft. Schyler, New York

- Texas Maritime College Galveston, Texas

These institutions, although state funded, receive financial assistance from MARAD as authorized under the Maritime Training Act of 1980. In addition to the USCG licenses, the graduates of state maritime academies also receive Bachelor of Science degrees. In the case of Great Lakes Maritime Academy, however, the graduates receive associate degrees along with licensure.

Mr. David Buchanan, Office of Admissions of California Maritime Academy, stated that recruitment efforts for the academy is not unlike other state colleges. But the average entrant, however, is slightly older than typical entering college freshmen with an average age at graduation of approximately 22.2 years. In 1993 the graduating class of the California Maritime Academy included 27 students who were over 34 years old. This age factor is important when looking at the number of graduates eligible to serve in the military on active duty. The age limit for acceptance into active duty military status is 35 years.

In 1991 a total of 390 officers graduated from all six academies.

After graduation, 95.4 percent of the graduates found employment in the maritime industry aboard ship or ashore, or were serving on active duty in the U.S. Navy or Coast Guard. State maritime academy cadets who participate in the Student Incentive Payment Program receive $1,200 annually to offset school costs. Participating cadets are obligated to remain employed in the maritime industry for 3 years, to accept a reserve

commission in the Navy or one of the other armed forces, and to renew or upgrade their U.s. Coast Guard merchant marine license. (MARAD, 47)

C. UNION SCHOOLS

United States safety and operating requirements for American flag ships are the most stringent among maritime nations. Seamanship is a profession. Licensed and unlicensed seamen undergo extensive training and at various intervals require updating in their training.... Their [union schools] purpose is to better educate and train seamen to keep pace with the advanced technology of the various types of ships comprising a large and growing segment of the American merchant marine in recent years. The maritime unions recognize also the need to attract younger personnel to seafaring with opportunities for advancement. As improved ship technology and automation reduce the unskilled entry positions, a more highly trained crew becomes necessary. To achieve this end, 12 unions have established 17 job-oriented, U.S. Coast Guard-approved schools and facilities to train and up-grade their licensed and unlicensed members. A number of the schools include academic as well as vocational courses. Some are funded through collective bargaining agreements between the unions and operator; others are funded by federal grants for manpower training. All of the schools appear to be carrying out their educational and training functions in a highly satisfactory manner. (Heine, 79)

Some of the training facilities and graduate qualifications are shown in Table 12. Data on the number of yearly graduates and qualifications awarded was unavailable.

Table 12 Union Schools[1]	
School	Qualifications
Harry Lundeberg School of Seamanship	OS, Wiper, Food Handler, AB, 3rd Mate, Towboat Operator, Master/Mate, 1st Class Pilot, Fireman, Watertender, Oiler, Pumpman, Refer Eng., Electrician, Machinist, Deck Eng., Jr. Eng., Chief Eng. Asst. Eng., Asst. Cook Utility, Cook and Baker, Chief Cook, Chief Steward
Maritime Institute of Technology and Graduate Studies (MITAGS)	Second Mate, Chief Mate, Captain
Job Corps	Lifeboatman, AB, QMED
Marine Engineer's Beneficial Asso. (MEBA) District II	3rd Mate, 2nd Mate, Chief Mate, Captain, 3rd Asst. Eng., 2nd Asst. Eng., 1st Asst. Eng., Chief Eng.
Sea School	Operator Uninspected Passenger Vessels (OUPV), Engineer, QMED, AB, Master/Mate (Inland)
[1] Taken from CMMM, p., C-9	

D. OTHER ACCESSION POINTS

Former military service members from the U.S. Navy and USCG, usually have the necessary experience and training to serve as a qualified merchant mariner. If not immediately qualified, there are few additional requirements necessary for these prior service members to obtain Coast Guard licenses. The Coast Guard service members are very familiar with the mariner job opportunities because their Coast Guard experiences involve knowing more about the maritime industry than their Navy counterparts. According to CDR Davila, Maritime Safety Office, USCG, Oakland, recruitment of proper Naval Service members could be made more effective. In his

experience "few Navy members are aware of their eligibility for the MM and many are not familiar with the merchant mariner job itself. (Davila, interview, June 1994)

E. PRELIMINARY CONCLUSIONS

Merchant mariners arise from various accession points. In many cases graduates are not obligated to work in the maritime industry, although the majority of those from the federal merchant marine academy do. The fact that the graduate from the federal academy has certain commitments to serve in the maritime industry may surely be an influential issue.

The 40 per cent of graduates working ashore in 1990 can not be understood to mean that 60% of the academy graduates from 1975 to 1990 are still "at-sea." One can only look at the possibility that the 40 per cent remaining ashore are qualified, eligible, and willing to serve onboard mobilized RRF ships if needed.

VII. THE RRF IN THE YEAR 2001

To determine the number of mariners needed to man the RRF in the year 2001, there is a need to first determine how the RRF will be configured at that time, including the type and quantity of ships. The type of vessels will determine the required skill levels needed and the number of mariners needed of that skill or billet. This chapter will examine the strategic sealift asset plan for the U.S., of which the RRF is a part. This plan denotes what the nation's strategic sealift assets should be, specifically the number of ships required to sealift necessary material and equipment to a region of conflict. Given that number of sealift ships expected to be in the fleet in 2001, a table listing the Certificate of Inspection (COI) manning requirements for those ships is provided concluding with the total number of mariners needed to man the RRF. The chapter ends with final conclusions and recommendations for manning the RRF in the year 2001.

A. SEALIFT ASSETS IN 2001

As previously mentioned in Chapter III, the Mobility Requirements Study (MRS) provided sealift requirements for the year 1999.

> Among other recommendations, this volume [of the MRS] proposed acquisition (through new construction and conversion) of additional sealift capacity equal to 20 large, medium-speed, roll on/roll-off (RO/RO) ships; expansion by FY 1999 of the RRF from 96 ships to 142 ships; and increase in the readiness of the RRF." (MARAD 92, 52)

Review of this plan is ongoing; however, according to LCDR Tom Beall of the Strategic Sealift Division of U.S. Transportation Command (USTRANSCOM), the MRS recommendations are a close estimate of the current status of the sealift asset plans. To date, the plan includes the type ships listed in Table 13, and totals 130 vessels. (Beall, 1-4)

TABLE 13
RRF Strategic Sealift Plan[1]

Ship Type	Number
LMSR[2]	11
FSS[3]	8
RO/RO[4]	36
B/B[5]	48
LASH[6]	4
Seabee[7]	3
T-ACS[8]	9
Tanker	8
OPDS[9]	3
Total	130

1. Taken from USTRANSCOM Sealift Shiplist 2. Large, Medium-Speed RO/RO. 3. Fast Sealift 4. Roll-on, Roll-off 5. Breakbulk 6. Lighter Aboard Ship 7. Sea Barge 8. Aviation Support 9. Offshore Petroleum Delivery System-Tanker

This total number of 130 includes those ships to be placed in a reduced operating status (ROS), of which there are 48. The remaining ships will be placed in five, ten, and twenty day readiness status as depicted in Table 14. A ship in this status is maintained in a way that cuts down the time needed to reactivate the vessel by stationing crew members onboard during berthing. More explanation of crewing during ROS is discussed in the next section. In addition to the change in RRF ships due to placing them in ROS status, some of the vessels will be physically modified to enhance their capabilities. This modification includes outfitting certain ships with cargo delivery systems in which tensioned highlines are either received or sent to a ship to facilitate transfer of cargo. Known as the Sealift Enhancement Feature Program, this project would upgrade six RRF ships with a modular cargo delivery system (MCDS). MARAD expects to have 10 RRF ships capable of receiving tensioned highlines and 7 capable of sending tensioned highlines, 9 of which are also fitted with helicopter platforms. (MARAD 92, 54)

B. MANNING ISSUES

Two types of crews have been considered in order to accomplish the quicker reactivation process known as ROS.

> The first type, a retention crew, would consist of two licensed marine engineers to oversee all maintenance and repair of the vessel while in layup and be the core

> members of the operating crew during activations and exercises. They would also conduct routine preventative maintenance on a year-round basis.
> The second type, a Reduced Operating Status (ROS) crew, would live aboard and maintain the vessels in 4-day activation readiness. The projected 10-person ROS crew will consist of a mix of licensed and unlicensed personnel from all departments, who will conduct ongoing preventative maintenance year round, as well as provide the nucleus of an operating crew. ROS ships are to have sea trials annually, funds permitting. (MARAD 92, 52)

The MCDS, mentioned in the previous section, affects the manning requirement of those particular modified ships by including additional special crew members experienced in the tensioned highline procedures during underway replenishment as discussed in Chapter V.

The strategic sealift plan (Table 13) and the current COI required manning for those vessels can be combined to approximate the number of crew needed and the skill types required for initial surge shipping of all 130 RRF vessels. (see Table 14) The ROS ships will have 10 to 17 crew members from each department already embarked as a part of the ship's crew. Therefore, the numbers listed in Table 14 can be reduced by at least one for each perspective department. Of note in this table also is the fact that the lifeboatmen and the tankermen duties are usually performed by one of the other members of the crew and are not necessarily counted separately.

The LMSRs are currently under construction. They are ship class (CSS-24) with an average total square footage of 380,000 square feet each. No COI had been issued on any of

these ships at the time of writing, therefore COI manning requirements for the new LMSRs were not included.

As depicted in Table 14, Part A, some ships' COIs were unavailable. Based on the available information, Table 14 provides quantity and skill types of crew members required by the COIs of those ships. This number includes the COI manning requirements for 70 ships. The number does not include the special crews needed on those Sealift Enhancement Program Ships (SEPS) discussed in Chapter V. Nor does this number include support personnel such as stewards and cooks. The last column in Table 14, Part B, labeled Other Crew, however may include these numbers.

Table 14
Part A
2001 RRF Manning Requirements

	Breakbulks Five Day Readiness Status:										
	NAME	LM	TM	M	CM	2M	3M	FP	P	R	AS
1	Adventurer (S)	6	0	1	1	1	1	0	0	1	6
2	Aide (S)	6	0	1	1	1	1	0	0	1	6
3	Cape Jacob (S)	6	0	1	1	1	1	0	0	1	6
4	Cape Blanco (S)	5	0	1	1	1	1	0	0	1	6
5	Cape Borda (S)	4	0	1	1	1	1	0	0	1	6
6	Cape Bover (S)	4	0	1	1	1	1	0	0	1	6
7	Cape Breton (S)	4	0	1	1	1	1	0	0	1	6
8	Cape Carthage*										
9	Cape Catoche (S)	6	0	1	1	1	1	0	0	1	6
10	Cape Clear (S)	3	0	1	1	1	1	0	0	1	6
11	Cape Cod*										
12	Cape Gibson (S)	6	0	1	1	1	1	0	0	1	6
13	Cape Girardeau (S)	5	0	1	1	1	1	0	0	1	6
14	Cape John (S)	6	0	1	1	1	1	0	0	1	6
15	Scan (S)	6	0	1	1	1	1	0	0	1	6
	Subtotal:	67	0	13	13	13	13	0	0	13	78

	Legend: LM - Lifeboatmen TM - Tankermen M - Master CM - Chief Mate 2M - Second Mate	3M - Third Mate FP - First Pilot P - Pilot R - Radio Officer AS - Able Seamen

	Table 14: Part A continued										
	Breakbulks 10 Day Readiness Status:										
16	Agent*										
17	Ambassador (S)	5	0	1	1	1	1	0	0	1	6
18	Banner (S)	7	0	1	1	1	1	0	0	1	6
19	Buyer (S)	5	0	1	1	1	1	0	0	1	6
20	Cape Alava (S)	5	0	1	1	1	1	0	0	1	6
21	Cape Alexander*										
22	Cape Ann (S)	5	0	1	1	1	1	0	0	1	6
23	Cape Archway*										
24	Cape Avinof (S)	5	0	1	1	1	1	0	0	1	6
25	Cape Bon (S)	5	0	1	1	1	1	0	0	1	6
26	Cape Canaveral (S)	6	0	1	1	1	1	0	0	1	6
27	Cape Canso (S)	6	0	1	1	1	1	0	0	1	6
28	Cape Catawba (S)	5	0	1	1	1	1	0	0	1	6
29	Cape Chalmers (S)	6	0	1	1	1	1	0	0	1	6
30	Cape Johnson*										
31	Cape Juby (S)	6	0	1	1	1	1	0	0	1	6
32	Cape Nome (S)	5	0	1	1	1	1	0	0	1	6
33	Courier*										
34	Del Monte*										
35	Del Valle*										
36	Del Viento*										
37	Gulf Banker (S)	3	0	1	1	1	1	0	0	1	6
38	Gulf Farmer (S)	6	0	1	1	1	1	0	0	1	6
39	Gulf Merchant (S)	3	0	1	1	1	1	0	0	1	6
40	Gulf Shipper (S)	3	0	1	1	1	1	0	0	1	6

Table 14: Part A continued											
41	Gulf Trader (S)	3	0	1	1	1	1	0	0	1	6
42	Lake (S)	6	0	1	1	1	1	0	0	1	6
43	Northern Light (S)	8	0	1	1	1	1	0	0	1	6
44	Pioneer Commander (S)	6	0	1	1	1	1	0	0	1	6
45	Pioneer Contractor (S)	3	0	1	1	1	1	0	0	1	6
46	Pioneer Crusader (S)	5	0	1	1	1	1	0	0	1	6
47	Pride*										
48	Southern Cross (S)	6	0	1	1	1	1	0	0	1	6
	Subtotal:	123	0	24	24	24	24	0	0	24	144
LASH Five and Ten Day Readiness:											
49	Cape Fear (S)	6	0	1	1	1	1	0	0	1	6
50	Cape Farewell*										
51	Cape Flattery*										
52	Cape Florida (S)	4	0	1	1	1	1	0	0	1	3
	Subtotal:	10	0	2	2	2	2	0	0	2	9
SEABEE Five and Ten Day Readiness:											
53	Cape Mendocino*										
54	Cape May*										
55	Cape Mohican*										

Table 14: Part A continued											
TACS Five and Ten Day Readiness:											
56	Flickertail State (S)	10	0	1	1	1	1	0	0	1	6
57	Gem State (S)	5	0	1	1	1	2	0	0	1	9
58	Diamond State*										
59	Green Mtn. State (S)	3	0	1	1	1	2	0	0	1	9
60	Cornhusker State (S)	9	0	1	1	1	1	0	0	1	6
61	Equality State (S)	9	0	1	1	1	2	0	0	1	9
62	Keystone State (S)	8	0	1	1	1	2	0	0	1	9
63	Grand Canyon State (S)	10	0	1	1	1	2	0	0	1	9
64	Beaver State (S)	5	0	1	1	1	1	0	0	1	6
	Subtotal:	59	0	8	8	8	13	0	0	8	63
Tankers Ten and Twenty Day Readiness:											
65	Alatna (D)	3	0	1	1	1	1	0	0	1	6
66	American Explorer (S)	6	0	1	1	1	1	0	0	1	6
67	Chattahochee (D)	3	0	1	1	1	1	0	0	1	6
68	Mission Buenaventura (S)	4	0	1	1	1	1	0	0	1	6
69	Mission Capestrano (D)	3	0	1	1	1	1	0	0	1	6
70	Mount Vernon*										
71	Nodaway (D)	0	0	1	1	1	1	0	0	1	6
72	Petersburg*										
73	Potomac (S)	6	0	1	1	1	1	0	0	1	6
74	Shoshone (S)	6	0	1	1	1	1	0	0	1	6
75	Chesapeake (S)	4	3	1	1	1	1	0	0	1	6
	Subtotal:	35	3	9	9	9	9	0	0	9	54

Table 14; Part A continued:

RO/RO ROS Four Day Readiness:

76	Admiral Callaghan (G)	4	0	1	1	1	1	0	0	1	6
77	Cape Diamond (D)	7	0	1	1	1	1	0	0	1	6
78	Cape Domingo (D)	6	0	1	1	1	1	0	0	1	6
79	Cape Henry*										
80	Cape Edmont*										
81	Cape Inscription (S)	5	0	1	1	1	1	0	0	1	6
82	Cape Isabel (S)	3	0	1	1	1	1	0	0	1	6
83	Cape Lambert (D)	4	0	1	1	1	1	0	0	1	6
84	Cape Lobos (D)	4	0	1	1	1	1	0	0	1	6
85	Cape Intrepid (S)	5	0	1	1	1	1	0	0	1	6
86	Cape Island (S)	8	0	1	1	1	1	0	0	1	6
87	Cape Taylor (D)	5	0	1	1	1	1	0	0	1	6
88	Cape Texas*										
89	Cape Decision*										
90	Cape Ducato*										
91	Cape Race*										
92	Cape Rise*										
93	Cape Ray*										
94	Cape Trinity*										
95	Cape Orlando*										
96	Cape Vincent*										
97	Cape Victory*										
98	Cape Douglas*										
99	Cape Horn*										
100	Cape Hudson*										
101	Cape Washington*										

Table 14; Part A continued:											
RO/RO ROS Four Day Readiness:											
102	Cape Wrath*										
103	Meteor (S)	6	0	1	1	1	1	0	0	1	6
104	Comet (S)	6	0	1	1	1	1	0	0	1	6
	Subtotal:	63	0	12	12	12	12	0	0	12	72
	TOTALS:	357	3	68	68	68	73	0	0	68	420
105-111	Seven (7) Additional RO/RO's planned for construction or conversion										
112-119	Eight (8) Fast Sealift Ships in ROS-4 Status										
120-130	Eleven (11) LMSR's planned for construction or conversion										

Table 14
Part B
2001 RRF Manning Requirements

	Breakbulks Five Day Readiness Status:									
	NAME	OS	DH	CE	1E	2E	3E	FM	O	OC
1	Adventurer (S)	3	0	1	1	1	1	3	3	0
2	Aide (S)	3	0	1	1	1	1	3	3	14
3	Cape Jacob (S)	3	0	1	1	1	1	3	3	16
4	Cape Blanco (S)	3	0	1	1	1	1	0	3	17
5	Cape Borda (S)	3	0	1	1	1	1	0	3	17
6	Cape Bover (S)	3	0	1	1	1	1	0	3	19
7	Cape Breton (S)	3	0	1	1	1	1	0	3	19
8	Cape Catoche (S)	3	0	1	1	1	1	3	3	27
9	Cape Clear (S)	3	0	1	1	1	1	3	3	16
10	Cape Gibson (S)	3	0	1	1	1	1	0	3	27
11	Cape Girardeau (S)	3	0	1	1	1	1	0	3	27
12	Cape John (S)	3	0	1	1	1	1	3	3	16
13	Scan (S)	3	0	1	1	1	1	3	3	24
	Subtotal:	39	0	13	13	13	13	21	39	239
	Legend: OS - Ordinary Seamen DH - Deck Hand CE - Chief Engineer 1E - First Engineer 2E - Second Engineer						3E - Third Engineer FM - Firemen O - Oiler OC - Other Crew			

	Table 14; Part B continued:									
	Breakbulks 10 Day Readiness Status:									
14	Ambassador (S)	3	0	1	1	1	1	3	3	29
15	Banner (S)	3	0	1	1	1	1	3	3	16
16	Buyer (S)	3	0	1	1	1	1	3	3	16
17	Cape Alava (S)	3	0	1	1	1	1	3	3	24
18	Cape Ann (S)	3	0	1	1	1	1	3	3	38
19	Cape Avinof (S)	3	0	1	1	1	1	3	3	38
20	Cape Bon (S)	3	0	1	1	0	2	0	3	19
21	Cape Canaveral (S)	3	0	1	1	1	1	3	3	26
22	Cape Canso (S)	3	0	1	1	1	1	3	3	29
23	Cape Catawba (S)	3	0	1	1	1	1	3	3	16
24	Cape Chalmers (S)	3	0	1	1	1	1	3	3	15
25	Cape Juby (S)	3	0	1	1	1	1	3	3	29
26	Cape Nome (S)	0	3	1	1	1	1	3	3	21
27	Gulf Banker (S)	3	0	1	1	1	1	3	3	16
28	Gulf Farmer (S)	3	0	1	1	1	1	3	3	16
29	Gulf Merchant (S)	3	0	1	1	1	1	3	3	16
30	Gulf Shipper (S)	3	0	1	1	1	1	3	3	14

Table 14; Part B continued:										
31	Gulf Trader (S)	3	0	1	1	1	1	3	3	16
32	Lake (S)	3	0	1	1	1	1	3	3	24
33	Northern Light (S)	3	0	1	1	1	1	3	3	23
34	Pioneer Commander (S)	3	0	1	1	1	1	3	3	16
35	Pioneer Contractor (S)	3	0	1	1	1	1	3	3	16
36	Pioneer Crusader (S)	3	0	1	1	1	1	3	3	16
37	Southern Cross (S)	3	0	1	1	1	1	3	3	24
	Subtotal:	69	3	24	24	23	25	69	72	513
LASH Five and Ten Day Readiness:										
38	Cape Fear (S)	3	0	1	1	1	1	3	3	23
39	Cape Florida (S)	3	0	1	1	1	1	0	3	8
	Subtotal:	6	0	2	2	2	2	3	6	31
TACS Five and Ten Day Readiness:										
40	Flickertail State (S)	0	0	1	1	1	1	3	3	48
41	Gem State (S)	3	0	1	1	1	1	3	3	30
42	Green Mtn. State (S)	3	0	1	1	1	1	3	3	41

Table 14; Part B continued:										
43	Cornhusker State (S)	0	0	1	1	1	1	0	3	0
44	Equality State (S)	3	0	1	1	1	1	3	3	38
45	Keystone State (S)	3	0	1	1	1	1	3	3	11
46	Grand Canyon State (S)	3	0	1	1	1	1	3	3	46
47	Beaver State (S)	3	0	1	1	1	1	0	3	0
	Subtotal:	18	0	8	8	8	8	18	24	214
Tankers Ten and Twenty Day Readiness:										
48	Alatna (D)	3	0	1	1	1	1	0	0	10
49	American Explorer (S)	3	0	1	1	1	1	0	3	17
50	Chattahochee (D)	3	0	1	1	1	1	0	0	10
51	Mission Buenaventura (S)	0	0	1	1	1	1	0	3	11
52	Mission Capestrano (D)	0	0	1	1	1	1	0	3	9
53	Nodaway (D)	3	0	1	1	1	1	0	3	0
54	Potomac (S)	3	0	1	1	1	1	0	3	11
55	Shoshone (S)	3	0	1	1	1	1	0	3	20
56	Chesapeake (S)	0	2	1	1	1	1	0	3	15
	Subtotal:	18	2	9	9	9	9	0	21	103

Table 14; Part B continued:										
RO/RO ROS Four Day Readiness:										
57	Admiral Callaghan (G)	0	0	1	1	1	1	0	3	16
58	Cape Diamond (D)	0	0	1	1	1	1	0	3	12
59	Cape Domingo (D)	0	0	1	1	1	1	0	3	18
60	Cape Inscription (S)	3	0	1	1	1	1	0	3	19
61	Cape Isabel (S)	3	0	1	1	1	1	0	3	22
62	Cape Lambert (D)	0	0	1	1	1	1	0	3	9
63	Cape Lobos (D)	0	0	1	1	1	1	0	3	9
64	Cape Intrepid (S)	3	0	1	1	1	1	0	3	17
65	Cape Island (S)	3	0	1	1	1	1	0	0	26
66	Cape Taylor (D)	0	0	1	1	1	1	0	0	19
67	Meteor (S)	3	0	1	1	1	1	0	3	53
68	Comet (S)	3	0	1	1	1	2	3	3	25
	Subtotal:	18	0	12	12	12	13	3	30	245
	TOTALS:	168	5	68	68	67	70	114	192	1345

C. CONCLUSIONS

America's national defense strategy has recently undergone scrutiny due to the collapse of the Soviet Union. For the past 40 years America's national defense strategy focused on the Soviet Threat and defense against that threat. America's efforts were directed toward containment of the communist influences with aggressive tactics aimed at any attempted expansion on the part of the Soviet Union. America's attention is still directed to interests **overseas**. It is the **overseas** concept that makes the RRF and its ability to lift equipment efficiently and effectively to a region of conflict that justifies examination of the nation's RRF manning capabilities.

In the past and even more so now, the nation's defense relies on its ability to be where the action is or at least be able to get there quickly. Once in position, the forces must be sustained. These requirements depend on the nation's ability to move people and equipment to the desired overseas location. The need for a viable maritime strategy, of which the Ready Reserve Force (RRF) is a part, is couched in the nation's defense strategy and is extremely important.

D. RECOMMENDATIONS

Given the RRF history, results of RRF manning studies previously conducted, the procedures in place to activate

RRF ships, required skill levels of personnel manning RRF ships and the various points of accession into the maritime workforce, this thesis has attempted to determine the manning requirements for the RRF in the year 2001.

There are currently 17 ships in the ROS. The plan to increase the number of ships in this status will ensure an immediate response capability should the RRF be needed in the future. This program should be continued and the funding must be provided. By maintaining ships with these ROS crews there are fewer manning requirements to fill during a large-scale RRF activation.

An uninformed and cursory look at the RRF manning issue overlooks the importance of a national merchant marine that is viable and capable of answering the call for national defense purposes. The U.S. merchant fleet is the vital link in the ability to sufficiently man the RRF during war. Commercial shipping management, seafaring unions, and government policy makers must continue to work toward a mutually agreeable solution to terminate the rapid decrease in the number of qualified seafarers capable of crewing the RRF.

MARAD's study, MMWSDA, discussed in Chapter III is the fifth study in a continuing series concerning the supply and demand of merchant marine manpower for industry and Government. This practice of publishing a continuing series of officer supply and demand studies should be continued and

expanded where necessary so that manning trends can be traced on a continual basis.

Based on the findings of this thesis, if the need arises in which the RRF must activate its full complement of ships, the nation would require 1,517 crew members to operate 68 vessels. This total is derived by adding all Masters, Chief Mates, Second Mates, Third Mates, First Pilots, Pilots, Radio Officers, Able Seamen, Ordinary Seamen, Deck Hand, Chief Engineers, First Engineers, Second Engineers, Third Engineers, Firemen, and Oilers. In addition 1,345 other crew would be authorized by the COI to sail onboard the ships. These numbers represent manning requirements for 68 ships.

There were 359 U.S.-Flag Seagoing Vessels reported in 1993. (Pouch, 148) Activation of a large number of RRF ships increases the need for experienced crew members and far exceeds peacetime (non defense) requirements. Sources of additional manning must be determined before this contingency arises. One study, discussed in Chapter III, suggests that the "domestic labor" market of the inland waterway, Great Lakes, and Fishing Industries, be considered as possible manning sources. (CMMM, VII-1) The U.S. should understand those possibilities for sources of RRF manning and take steps to institute using those sources effectively and efficiently.

The Crewing the Merchant Marine for Mobilization (CMMM) study outlined several possible solutions to the manning issue. All of the suggestions have some financial obligation associated with them. The capability to man the nation's RRF ships is a question of insurance. How insured does America want to be? The dollar figures that will be allocated to provide for manning during RRF activations answers that question. It is this author's contention that the U.S. government has many well informed solutions placed before it from previous studies and reports. It is now time to decide, as mentioned before, how much of an insurance premium the nation is willing to pay for the very vital resource, qualified merchant mariners.

APPENDIX A: READY RESERVE FLEET INVENTORY

AS OF January 31, 1994

Legend:

JR	James River (East Coast)
B	Beaumont (Gulf Coast)
SB	Suisun Bay (West Coast)

Name	Blt/Conv	Design	Homeport	Remarks
RRF - BREAKBULK				
CAPE CATAWBA	1960	C3-S-33a	JR	RRF 10
LAKE	1961	C3-S-33a	JR	RRF 10
PRIDE	1960	C3-S-33a	JR	RRF 10
SCAN	1961	C3-S-33a	Cheatham Annex, VA	RRF 5
SOUTHERN CROSS	1962	C3-S-33a	Quincy, MA	RRF 10; UNREP CONSOL. Mass Maritime Sealift Program
CAPE CANAVERAL	1964	C3-S-37c	JR	RRF 10
CAPE CANSO	1963	C3-S-37c	JR	RRF 10; SEF outfit
CAPE CHALMERS	1963	C3-S-37c	JR	RRF 10
CAPE COD	1963	C3-S-37c	New York, NY	RRF 5
CAPE CLEAR	1963	C3-S-37c	New York, NY	RRF 5
CAPE CARTHAGE	1963	C3-S-37c	Ft McHenry, MD	RRF 5; SEF outfit
CAPE CATOCHE	1963	C3-S-37c	Ft McHenry, MD	RRF 5; SEF outfit
CAPE JOHNSON	1962	C4-S-1u	JR	RRF 10; MCDS VERTREP
CAPE JUBY	1962	C4-S-1u	JR	RRF 10; MCDS VERTREP
CAPE ALAVA	1962	C4-S-58a	JR	RRF 10; UNREP CONSOL
CAPE ALEXANDER	1962	C4-S-58a	JR	RRF 10; MCDS
CAPE ANN	1962	C4-S-58a	JR	RRF 10; UNREP VERTREP
CAPE ARCHWAY	1963	C4-S-58a	JR	RRF 10; UNREP VERTREP
CAPE AVINOF	1963	C4-S-58a	JR	RRF 10; UNREP VERTREP
CAPE NOME	1969	C5-S-78a	JR	RRF 10
GULF BANKER	1964	C3-S-37d	B	RRF 10
GULF FARMER	1964	C3-S-37d	B	RRF 10
GULF MERCHANT	1965	C3-S-37d	B	RRF 10; SEF outfit
GULF SHIPPER	1964	C3-S-37d	B	RRF 10
GULF TRADER	1964	C3-S-37d	B	RRF 10; SEF outfit
BANNER	1961	C3-S-46a	B	RRF 10
DEL MONTE	1968	C3-S-76a	B	RRF 10
DEL VALLE	1968	C3-S-76a	B	RRF 10; SEF outfit
DEL VIENTO	1968	C3-S-76a	B	RRF 10
COURIER	1961	C3-S-46b	B	RRF 10
PIONEER COMMANDER	1963	C4-S-57a	B	RRF 10; SEF outfit
PIONEER CONTRACTOR	1963	C4-S-57a	B	RRF 10; SEF outfit
PIONEER CRUSADER	1962	C4-S-57a	B	RRF 10; SEF outfit
BUYER	1962	C3-S-46a	B	RRF 10
CAPE JACOB	1962	C4-S-1u	Mobile, AL	RRF 5; SEF outfit/MCDS/VERTREP
CAPE JOHN	1962	C4-S-1u	Mobile, AL	RRF 5; MCDS/VERTREP

Name	Blt/Conv	Design	Homeport	Remarks
RRF - BREAKBULK, (con't.)				
CAPE GIBSON	1968	C5-S-75a	Hunter's Pt	RRF 5; MCDS VERTREP
CAPE GIRARDEAU	1968	C5-S-75a	Hunter's Pt	RRF 5; MCDS/VERTREP
NORTHERN LIGHT	1961	C3-S-33a	SB	RRF 10
AGENT	1961	C3-S-38a	SB	RRF 10; UNREP CONSOL
AMBASSADOR	1960	C3-S-38a	SB	RRF 10; UNREP CONSOL
CAPE BON	1967	C4-S-66a	SB	RRF 10; SEF outfit
ADVENTURER	1960	C3-S-38a	Alameda, CA	RRF 5; UNREP CONSOL
AIDE	1960	C3-S-38a	Alameda, CA	RRF 5; UNREP CONSOL
CAPE BORDA	1967	C4-S-66a	Vancouver, WA	RRF 5; SEF outfit
CAPE BOVER	1967	C4-S-66a	Vancouver, WA	RRF 5; SEF outfit
CAPE BLANCO	1966	C4-S-66a	Portland, OR	RRF 5; SEF outfit
CAPE BRETON	1967	C4-S-66a	Portland, OR	RRF 5; SEF outfit
			TOTAL	48
RRF - AUXILIARY CRANE (TACS)				
CORNHUSKER STATE (TACS-6)	1969/88	C5-S-MA73c	JR	RRF 10
FLICKERTAIL STATE (TACS-5)	1969/88	C5-S-MA73c	JR	RRF 10
GOPHER STATE (TACS-4)	1973/87	C5-S-MA73c	Newport News, VA	RRF 5; MSC OPCON, Afloat Prepositioning Force
DIAMOND STATE (TACS-7)	1962/89	C6-S-MA1xb	New Orleans, LA	RRF 5
EQUALITY STATE (TACS-8)	1961/89	C6-S-MA1xb	New Orleans, LA	RRF 10
GRAND CANYON STATE (TACS-3)	1965/86	C6-S-MA1qd	SB	RRF 10
GEM STATE (TACS-2)	1966/85	C6-S-MA1qd	Hunter's Pt, CA	RRF 5
KEYSTONE STATE (TACS-1)	1966/84	C6-S-MA1qd	SB	RRF 10
GREEN MOUNTAIN STATE (TACS-9)	1965/90	C6-S-MA60d	Tacoma, WA	RRF 5
			TOTAL	9
RRF - RO/RO				
ADM WM M CALLAGHAN	1967	Gas Turbine	Ft McHenry, MD	ROS 4
CAPE HENRY	1979	G2-Diesel	Norfolk, VA	ROS 4; MSC OPCON, Afloat Prepositioning Force
CAPE HORN	1979	G2-Diesel	Norfolk, VA	ROS 4; MSC OPCON, Afloat Prepositioning Force
CAPE HUDSON	1979	G2-Diesel	Norfolk, VA	ROS 4; MSC OPCON, Afloat Prepositioning Force
CAPE DOMINGO	1973	G1-Diesel	Jacksonville, FL	ROS 4
CAPE DIAMOND	1972	G1-Diesel	Jacksonville, FL	ROS 4
CAPE DECISION	1973	G1-Diesel	Jacksonville, FL	ROS 4; MSC OPCON, Afloat Prepositioning Force
CAPE DOUGLAS	1973	G1-Diesel	Jacksonville, FL	ROS 4; MSC OPCON, Afloat Prepositioning Force
CAPE DUCATO	1972	G1-Diesel	Jacksonville, FL	ROS 4
CAPE EDMONT	1971	G0-Diesel	Jacksonville, FL	ROS 4

Name	Blt/Conv	Design	Homeport	Remarks
RRF - RO/RO,(con't)				
CAPE LAMBERT	1973	Diesel	Mobile, AL	ROS 4
CAPE LOBOS	1972	Diesel	Mobile, AL	ROS 4
CAPE INSCRIPTION	1976	C7-S-95a	Beaumont, TX	ROS 4
CAPE ISABEL	1976	C7-S-95a	Beaumont, TX	ROS 4
CAPE ISLAND	1977	C7-S-95a	Orange, TX	ROS 4
CAPE INTREPID	1976	C7-S-95a	Orange, TX	ROS 4
COMET	1958	C3-ST-14a	Hunters Point, CA	ROS 4
METEOR	1967	C4-ST-67a	Hunters Point, CA	ROS 4
			TOTAL	18
RRF - BARGE CARRIER				
CAPE FAREWELL	1973	C9-S-81d	Violet, LA	RRF 5; Contains 89 barges
CAPE FLATTERY	1973	C9-S-81d	Violet, LA	RRF 5; Contains 89 barges
CAPE FLORIDA	1971	C8-S-81b	Violet, LA	RRF 5; Contains 77 barges
CAPE FEAR (AUSTRAL LIGHTNING)	1971	C8-S-81b	Tacoma, WA	RRF 5; Contains 73 barges
			TOTAL	4
RRF - HEAVY LIFT				
CAPE MOHICAN	1973	C8-S-82a	JR	RRF 10; Contains 24 barges
CAPE MAY	1972	C8-S-82a	Newport News, VA	RRF 5; Contains 24 barges
CAPE MENDOCINO	1972	C8-S-82a	Newport News, VA	RRF 5; Contains 24 barges
			TOTAL	3
RRF - PRODUCT TANKER				
AMERICAN EXPLORER	1959	T5-S-Rm2a/24.2dwt	B	RRF 20
MISSION BUENAVENTURA	1968	Steam/38.2dwt	B	RRF 20
MISSION CAPISTRANO	1971	Diesel/37.3dwt	B	RRF 20
MOUNT VERNON	1961	Steam/49.2dwt	B	RRF 20
MOUNT WASHINGTON	1962	Steam/49.4dwt	B	RRF 20; OPDS 5 candidate
PETERSBURG	1963	Steam/50.0dwt	B	RRF 20; OPDS 4 candidate
AMERICAN OSPREY (OPDS 2)	1958/88	Steam/34.2dwt	B	RRF 10; MSC OPCON, Afloat Prepositioning Force
POTOMAC (OPDS 1)	1957/64/86	T5-S-12a/27.5dwt	B	RRF 10; MSC OPCOM, Afloat Prepositioning Force
SHOSHONE	1957	T5-S-12a/26.9dwt	SB	RRF 20
CHESAPEAKE (OPDS 3)	1964/91	Steam/50.0dwt	SB	RRF 20
NODAWAY (TAOG 78)	1945	T1-M-BT2/4.0dwt	Tsuneishi, JA	RRF 10; Assigned to Western Region
ALATNA (TAOG 81)	1957	T1-MET-24a/4.9dwt	Tsuneishi, JA	RRF 10; Assigned to Western Region
CHATTAHOOCHEE (TAOG 82)	1957	T1-MET-24a/4.9dwt	Tsuneishi, JA	RRF 10; Assigned to Western Region
			TOTAL	13

Name	Bit/Conv	Design	Homeport	Remarks
RRF - TROOPSHIP				
EMPIRE STATE	1962/89	S5-S-MA1ua	Fort Schuyler, NY	RRF 10; MSC OPCON
PATRIOT STATE	1964/86	S5-S1-MA49c	Buzzards Bay, MA	RRF 10; Mass Maritime schoolship loan
			TOTAL	2
			GRAND TOTAL RRF	97

APPENDIX B: RRF ACTIVATION HISTORY

1970 - 1993

TABLE B-1

	Vessel	Activation Date	Days to Activate	Days in Use		Vessel	Activation Date	Days to Activate	Days in Use
1	Washington	09/23/77	15	33	21	Northern Light	01/29/85	5	72
2	Pride	05/07/78	10	1	22	Southern Cross	02/28/85	1	106
3	Maine	11/20/78	28	87	23	Keystone State	08/08/85	6	10
4	Washington	12/11/78	6	1	24	Keystone State	09/16/85	5	65
5	Washington	08/19/80	26	72	25	Adventurer	01/07/86	13	1
6	Lincoln	08/11/80	4	147	26	Cape Ducato	01/24/86	5	93
7	Catawba Victory	07/24/81	6	1	27	Cape Bon	02/18/86	5	56
8	Washington	07/16/81	6	1	28	Cape Decision	02/25/86	5	173
9	President	07/16/81	8	1	29	Patriot State	09/08/86	5	8
10	Ohio	02/16/82	5	74	30	Cape Douglas	12/01/86	4	342
11	Lone Star Mariner	09/02/82	10	39	31	Pioneer Contractor	01/14/87	10	92
12	Cape Alexander	07/14/83	10	64	32	Cape Horn	01/14/87	9	122
13	California	09/07/83	5	57	33	Cape Borda	01/26/87	5	61
14	Pioneer Crusader	02/08/84	7	48	34	Cape Hudson	06/17/87	15	74
15	Keystone State	04/24/84	1	170	35	Cape Henry	06/19/87	15	79
16	Washington	05/29/84	10	17	36	Cape Breton	09/09/87	5	9
17	Cape Ann	08/22/84	10	36	37	Cape Edmont	02/01/88	2	0
18	Maine	01/02/85	9	53	38	Cape Ducato	02/10/88	14	75
19	California	01/29/85	4	78	39	Patriot State	06/13/88	6	6
20	President	01/29/85	71	1	40	Cape Mohican	07/05/88	17	42

Appendix B, Table B-1 continued

41	Gopher State	03/22/88	19	21	61	Cape Farewell	04/07/93	5	19
42	Cape Diamond	06/07/88	17	7	62	Cape Mohican	04/07/93	74	45
43	American Osprey	08/03/88	7	23	63	Equality State	06/11/93	6	45
44	Cape Mohican	04/17/89	10	38	64	Cape Isabel	09/07/93	3	2
45	Cape Horn	04/17/89	8	87	65	Cape Breton	09/07/93	4	2
46	Flickertail State	05/01/89	17	23	66	Comet	09/07/93	4	2
47	American Osprey	08/16/89	10	35	67	Cape Inscription	09/23/93	3	2
48	Cape Domingo	08/21/89	0	0	68	Grand Canyon State	09/23/93	7	2
49	Cape Diamond	08/25/89	5	13	69	Meteor	11/17/93	4	2
50	Cape Henry	08/30/89	5	109					
51	Cape Mendocino	09/08/89	5	20					
52	Cape Hudson	09/12/89	9	79					
53	Cape Inscription	09/29/89	6	29					
See Table B-2 for Desert Sheild/Storm Activations									
54	Cape Inscription	01/03/90	4	14					
55	Gopher State	05/04/90	67	143					
56	Flickertail State	06/01/90	41	141					
57	Flickertail State	05/01/92	1	32					
58	Cape Henry	12/19/92	4	126					
59	Cape Henry	01/28/93	1	79					
60	Cape Intrepid	03/03/93	11	83					

Appendix B, Table B-2

A	B	C	D	E	F	G	H
SHIPNAME	TYPE	RRF	YRS.	P	ACTIV.	ACTIVATION	ACTIVATION
		STATUS	OLD		SITE	ORDERED	COMPLETED
CAPE HENRY	RO/RO	5	11	D	NORF	3	8
CAPE HUDSON	RO/RO	5	11	D	NORF	3	8
CAPE INSCRIPTION	RO/RO	5	14	S	MOBILE	3	8
CAPE DOMINGO	RO/RO	5	17	D	NORF	3	10
CAPE LOBOS	RO/RO	5	18	D	NORF	3	11
CAPE HORN	RO/RO	5	11	D	OAKLAND	3	13
JUPITER	RO/RO	5	14	S	TACOMA	3	13
CAPE ISABEL	RO/RO	5	14	S	PORTLAND	3	14
CAPE DOUGLAS	RO/RO	5	17	D	JAX	3	17
CAPE DUCATO	RO/RO	5	18	D	LA	3	17
CAPE EDMONT	RO/RO	5	19	D	PORTLAND	3	17
COMET	RO/RO	5	32	S	PORTLAND	3	18
METEOR	RO/RO	5	23	S	LA	3	18
ADM. CALLAGHAN	RO/RO	20	23	G	NORF	3	19
CAPE DECISION	RO/RO	5	17	D	BALTIMORE	3	22
CAPE ALEXANDER	BB	5	28	S	NORF	3	24
CAPE LAMBERT	RO/RO	5	17	D	NORF	3	63
CAPE DIAMOND	RO/RO	5	18	D	NORF	3	134
CAPE FAREWELL	LASH	5	17	S	MOBILE	8	12
CAPE FLATTERY	LASH	5	17	S	MOBILE	8	13
CAPE MOHICAN	SEABEE	5	17	S	NORF	8	15
CAPE MAY	SEABEE	5	18	S	MOBILE	8	16
CAPE FLORIDA	LASH	5	19	S	MOBILE	8	72
CAPE CLEAR	BB	10	27	S	BEAU	11	17
GULF BANKER	BB	10	26	S	BEAU	11	18
CAPE JUBY	BB	5	28	S	NORF	11	21
CAPE CATOCHE	BB	5	27	S	PROV	11	22
CAPE JOHNSON	BB	5	28	S	NORF	11	35
CAPE BORDA	BB	5	23	S	SANFR	12	19
CAPE BRETON	BB	5	23	S	SANFR	12	19
WASHINGTON	BB/VEH	10	46	S	BEAU	12	23
EQUALITY STATE	T-ACS	5	29	S	NORLEANS	12	24
GULF TRADER	BB	5	26	S	BEAU	12	25
CAPE ARCHWAY	BB	5	27	S	BALTIMORE	12	27
CORNHUSKER STATE	T-ACS	5	21	S	NORF	12	32
CAPE NOME	BB	5	21	S	NORF	12	37
DEL VALLE	BB	10	22	S	BEAU	12	38
DELMONTE	BB	5	22	S	BEAU	12	CANX
CAPE MENDOCINO	SEABEE	5	18	S	NORLEANS	22	27
MAINE	BB/VEH	10	46	S	BEAU	22	36
AMERICAN OSPREY	TANKER	10	32	S	BEAU	23	34
AUSTRAL LIGHTNING	LASH	5	19	S	SANFR	45	50
CAPE GIBSON	BB	5	22	S	SUISAN BAY	45	50
CAPE GIRARDEAU	BB	5	22	S	SUISAN BAY	45	50

Appendix B, Table B-2, continued:

A	B	C	D	E	F	G	H
DELMONTE						94	103
CAPE ANN	BB	5	28	S	QUONSET	94	CANX
CAPE BOVER	BB	5	23	S	SANFR	119	123
CAPE BLANCO	BB	5	24	S	TACOMA	119	124
CALIFORNIA	BB	5	28	S	ALAMEDA	119	125
CAPE BON	BB	5	23	S	SANFR	119	125
NORTHERN LIGHT	BB	5	29	S	PORTLAND	119	125
CAPE CHARLES	BB	10	27	S	BEAU	119	126
DIAMOND STATE	T-ACS	5	28	S	NORLEANS	119	129
CAPE CARTHAGE	BB	5	27	S	MELVILLE	119	130
SANTA ANA	BB	10	27	S	BEAU	119	156
CAPE CATAWBA	BB	10	30	S	BEAU	119	134
CAPE COD	BB	10	27	S	BEAU	119	135
CAPE CANSO	BB	5	27	S	JAX	119	139
LAKE	BB	5	29	S	PHIL	119	169
PRIDE	BB	5	30	S	PHIL	119	161
SCAN	BB	5	29	S	PHIL	119	CANX
BANNER	BB	10	29	S	NORV	119	168
COURIER	BB	10	28	S	NORV	119	155
POTOMAC	TANKER	5	33	S	BEAU	122	135
AGENT	BB	5	29	S	NORVA	122	154
CAPE ALAVA	BB	10	28	S	NY	122	157
CAPE AVINOF	BB	5	27	S	PORTLAND	122	175
BUYER	BB	5	28	S	MOBILE	171	178
CAPE CANAVERAL	BB	5	26	S	BALTIMORE	171	179
AMBASSADOR	BB	10	30	S	NORFOLK	162	171
AIDE	BB	10	30	S	CHARLESTON	171	CANX
MISSION BUENAVENTURA	TANKER	5	22	S	JAX	182	

APPENDIX C: CERTIFICATE OF INSPECTION

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

EXPIRATION DATE: 07APR93

IMO NUMBER: 8450665

Certificate of Inspection

VESSEL NAME	OFFICIAL NUMBER	CALL SIGN	SERVICE
USNS COMET	1S450665	NJZP	FREIGHT SHIP
HOME PORT	**HULL MATERIAL**	**HORSEPOWER**	**PROPULSION**
NOT DOCUMENTED	STEEL	5500	STEAM TURBINE

PLACE BUILT	DATE BUILT	GROSS TONS	NET TONS	DWT	LENGTH
CHESTER, PA	01JAN58	13792	8933	10111	488.00

OWNER	OPERATOR
U.S. DEPT OF TRANSPORTATION MASSIF BUILDING RM 2117 400 7TH STREET S.W. WASHINGTON, DC 20590	MARITIME ADMINISTRATION WESTERN REGION 211 MAIN ST, ROOM 1112 SAN FRANCISCO, CA 94105

THIS VESSEL MUST BE MANNED WITH THE FOLLOWING LICENSED AND UNLICENSED PERSONNEL, INCLUDED IN WHICH THERE MUST BE 6 CERTIFICATED LIFEBOATMEN AND 0 CERTIFICATED TANKERMAN.

1 MASTER	___ MASTER & 1ST CLASS PILOT	6 ABLE SEAMEN	1 CHIEF ENGINEER	3 FIREMEN-WATERTENDERS
___ CHIEFMATE	___ ___ CLASS PILOT	3 ORDINARY SEAMEN	1 1ST ASST. ENGINEER	3 OILERS
___ 2ND MATE	1 RADIO OFFICER(S)	___ DECKHANDS	1 2ND ASST. ENGINEER	___ ___
___ 3RD MATES	___ OPERATOR(S)	___ ___	___ 3RD ENG'RS.	___ ___

IN ADDITION, THIS VESSEL MAY CARRY 0 PASSENGERS, 12 OTHER PERSONS IN CREW, 0 PERSONS IN ADDITION TO CREW, AND ___. TOTAL PERSONS ALLOWED: 12

ROUTE PERMITTED AND CONDITIONS OF OPERATION:

OCEANS

INSPECTED AND APPROVED FOR THE CARRIAGE OF FUELED VEHICLES IN CARGO HOLDS NO. 1 & 4. CARBON MONOXIDE LEVELS ARE TO BE MONITORED IN ACCORDANCE WITH 49 CFR 176.79 USING PORTABLE DETECTORS IN ADDITION TO THE FIXED DETECTORS WHENEVER VEHICLE ENGINES ARE OPERATED IN THESE SPACES.

THIS SHIP IS A READY RESERVE FORCE VESSEL.

*** SEE NEXT PAGE FOR ADDITIONAL CERTIFICATE INFORMATION ***

WITH THIS INSPECTION HAVING BEEN COMPLETED AT JACKSONVILLE, FLORIDA ON 07APR92, THIS VESSEL IS CERTIFIED BY THE OFFICER IN CHARGE, MARINE INSPECTION, JACKSONVILLE, FL , TO BE IN ALL RESPECTS IN CONFORMITY WITH THE APPLICABLE VESSEL INSPECTION LAWS AND THE RULES AND REGULATIONS PRESCRIBED THEREUNDER.

PERIODIC REINSPECTIONS

DATE	ZONE	SIGNATURE

THIS CERTIFICATE ISSUED BY:

[signature] J. MONTOYA, CDR, USCG

OFFICER IN CHARGE, MARINE INSPECTION
SAN DIEGO, CALIFORNIA

INSPECTION ZONE

DEPT. OF TRANSP., USCG, CG-841 (Rev. 2-85)
PREVIOUS EDITIONS ARE OBSOLETE

SN 7530-00-FOI-0070

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

Certificate of Inspection

--- HULL EXAMS ---

-EXAM TYPE-	-NEXT EXAM-	-LAST EXAM-	-PRIOR EXAM-
DRYDOCK	13DEC94	13DEC91	30DEC86
INTERNAL STRUCTURAL	13DEC94	13DEC91	30DEC86

--- STABILITY ---

LETTER BOOK APPROVAL DATE/ 22MAR85 OFFICE/ NYCMI

--- INSPECTION STATUS ---

FUEL TANKS

-TANK IDENTIFICATION-	-DATE EXAMINED-
1P, 1 SEC, 5P, 5C, 5S	13DEC91
2, 3 PI, 3 SI, 3 SO	13DEC91
3, 4A S, 4 PO, 4 PI, 4 SI	13DEC91
4, MACH PO, MACH PI	13DEC91
MACH SI, MACH SO	13DEC91

BOILERS/STEAM PIPING

MAXIMUM STEAM PRESSURE ALLOWED/ 725 PSI

					----------VALVES----------			
BOILER/PIPING	-----HYDRO-----		-----MOUNTS----		---SAFETY--		SUPERHEATER	
IDENTIFICATION--	LAST	NEXT	OPENED	REMOVED	SET	DATE	SET	DATE
1	13DEC91	13DEC95	02FEB89	03FEB89	Y	13AUG90	Y	13AUG90
2	13DEC91	13DEC95	02FEB89	03FEB89	Y	13AUG90	Y	13AUG90
1 STEAM PIPING	13DEC91	13DEC95						

PRESSURE VESSELS

TYPE	LOCATION	LAST	NEXT
AIR RECEIVER	ER	17APR91	17APR93
AIR RECEIVER	ER	17APR91	17APR93
LO HEATER	MACH SPACE	13DEC91	13DEC91

TAILSHAFT(S)

TAILSHAFT ID	DATE DRAWN	NEXT DUE DATE
1	13DEC91	13DEC96
2	13DEC91	13DEC96

LIFESAVING

LIFEBOAT/RAFT IDENTIFICATION	SERVICED/ REFURBISHED	WEIGHT TEST	FALLS RENEWED
FWD PORT LIFERAFT	25APR91		
AFT PORT LIFERAFT	25APR91		
FWD STBD LIFERAFT	25APR91		
AFT STBD LIFERAFT	25APR91		
PORT LIFEBOAT	17APR91	15APR91	17FEB89
STBD LIFEBOAT	17APR91	15APR91	17FEB89

*** SEE NEXT PAGE PLEASE ***

APPENDIX D: MANNING SOLUTIONS FOR MOBILIZATION

To Ensure Adequate Manning of RRF Ships during Mobilization

Following are USMS Reserve Options taken from the CMMM Study:

USMS Reserve Option A for State Academy Graduates . . proposes to offer students at the six State maritime academies a Student Incentive Payment (SIP) for four years while attending the academy in exchange for eight years in the USMS. These personnel would not receive a retainer fee during their membership in the USMS Reserve for their eight year obligation after graduation from a state academy.

USMS Reserve Option B . . [proposes] to have a minimum set of requirements for Reserve seafarers to maintain, but attractive enough benefits to induce inactive merchant marine manpower to participate. The peacetime cost is relatively low, especially in comparison to Options C and D. Additional wartime costs would be incurred. This solution would provide both licensed and unlicensed mariners for the surge and sustainment mobilization phases.

USMS Reserve Option C . . has training requirements in it. Option C Reservists would receive one week of training in such facilities [as maritime simulators] every two years. In addition to providing general mariner training, these periods would be used to fulfill the requirements of license renewal. All of the other requirements of Option B would remain with this training being the additional requirement for Option C Reservists.

USMS High Mix Option D . . calls for Reservists [to be] assigned to drill units, conduct periodic (quarterly) training with that unit, and undergo two weeks of active duty training per year. . Option D is a hybrid of Option C; it recognizes the need to pay an incentive to enlist the services of mariners, but it limits participation to key skills only. It recognizes the vital need for training, but it stops short of a full scale Reserve system, relying instead on paid annual intensive ACDUTRA over a two wee period. Lastly, it is designed as an

adjunct structure to the Option A USMS, in order to fill in senior licensed and unlicensed personnel, as needed. (CMMM, VI-1 - VI-8)

Solutions discussed in Table 7 of Chapter III which reduce the mobilization manning requirements include:

Shipping Company Initiatives . . [Shipping Companies can increase] the productivity of its merchant ships through organizational procedures and manpower improvements in its ship-shore work system.

U.S. Naval Reserve Solutions . .Crewing RRF/ROS ships with USNR personnel has been discussed for some time. The effect of such a move would be to significantly reduce civilian mobilization requirements. [The working group which looked into this issue in the mid 80's] ceased its efforts after the Office of Management and Budget decision to shift the RRF to MARAD for crewing during a national emergency.

RRF Caretaker Crews . . [This option places] a small caretaker crew [on ships]. These crews provide advantages for the activation and expeditious manning of these vessels.

Government Regulations to Reduce Requirements . . Waivers and/or changes to some Government merchant marine regulations will decrease mobilization requirements [with] the cooperation of shipping companies and maritime unions.

Reduced RRF Billet Requirements . . The proposed concept of Reduced Manning for RRF and ROS vessels entails crewing the ships for the initial surge with COI minimum manning requirements plus a few stewards.

APPENDIX E: INFORMATION FOR OBTAINING MERCHANT MARINER'S DOCUMENT

Information for Obtaining

an

" Original and Duplicate U. S. Merchant Mariner's Document "

Duplicate Certificate(s) of Discharge

Open: Monday - Friday
8:00am - 3:15pm

* * No Applications will be processed after 3:00pm * *

Closed Saturdays and Sundays,
and Federal Holidays.

Phone Numbers:
(510) 437-3092
(510) 437-3094

FAX Number:
(510) 437-3072

NO DOCUMENT WILL BE ISSUED BY MAIL, UNLESS APPROVED BY THE CHIEF, REGIONAL EXAMINATION CENTER. ALL DOCUMENTS MUST BE SIGNED AND FINGER PRINTED IN THE PRESENCE OF THE ISSUING OFFICER.

USCG Marine Safety Office San Francisco Bay
Regional Examination Center
San Francisco Bay
Coast Guard Island, Bldg. 14, Room 109
Alameda, CA 94501-5100

REVISED AS OF APR 1994

REQUIREMENTS FOR AN ORIGINAL
U. S. MERCHANT MARINER'S DOCUMENT

Service aboard U. S. Merchant Vessels is a form of civilian occupation and is obtained either by direct application to the various steamship companies or the maritime labor organization, representing merchant seaman. THE COAST GUARD DOES NOT OFFER OR ARRANGE FOR EMPLOYMENT ABOARD U. S. MERCHANT VESSELS. Maritime Organizations may be found by looking in the Yellow Pages of the phone book under "Labor" or "Steamship".

A. In order to obtain your U. S. Merchant Mariners Document you will have to provide the following information:

1. **LETTER OF COMMITMENT OF EMPLOYMENT** - This is a letter from an authorized representative of a shipping company (operating U. S. merchant vessels of at least 100 gross tons) or a maritime labor union stating that they are offering you maritime employment and thus requests that our Coast Guard Regional Examination Center issue you a U. S. Merchant Mariner's document endorsed with the entry level ratings of Ordinary Seaman, Wiper, or Food Handler. This "Letter of Commitment" **MUST** be presented along with the requirements listed below in order to fill out an application to obtain a U. S. Merchant Mariner's Document.

2. **Citizenship** - Native born U. S. Citizens **must** present the original **or** a certified copy of a Birth Certificate, **or** a current U. S. Passport, **or** a Certificate of Baptism issued within one year of birth.
   Naturalized U. S. Citizens must present a Certificate of Naturalization; along with a Current U. S. Passport or Original Birth Certificate.

   Permanent Resident Aliens must present I.N.S. Form I-551 (Resident Alien Card) **AND** a Birth Certificate or a passport issued by their government, a visa or other evidence satisfactory to this office that you entered this country legally.

3. **Social Security Card** - You must show your Social Security Card OR a letter from Social Security Administration showing that you've applied for a new or duplicate card and it MUST show your number on the letter.

4. **Drug Free Certificate** - A drug free certificate must be provided, from a S A M H S A (formerly N I D A) approved laboratory. (see pages 6 & 7 for more information.)

5. **Photographs** - See page (5).

6. **User Fees - See Page(8).**

USER FEES FOR MERCHANT MARINE DOCUMENTS
EFFECTIVE ON APRIL 19, 1993

I. **IF APPLICANT HAS NOT HAD A PREVIOUS COAST GUARD LICENSE OR MERCHANT MARINERS DOCUMENT:**

A. MERCHANT MARINER'S DOCUMENT WITHOUT A QUALIFIED RATING:

Evaluation Fee	Exam Fee	Issuance Fee
$17.00	0	$35.00

B. MERCHANT MARINER'S DOCUMENT WITH A QUALIFIED RATING:

Evaluation Fee	Exam Fee	Issuance Fee
$77.00	$40.00	$35.00

C. MERCHANT MARINER'S DOCUMENT WITH A QUALIFIED RATING ISSUED INCIDENT TO A LICENSE TRANSACTION:

Evaluation Fee	Exam Fee	Issuance Fee
0	$40.00	$35.00

Note: Exam Fee is charged only if a qualified rating examination is administered.

II. **IF APPLICANT HAS HAD A PREVIOUS COAST GUARD LICENSE OR MERCHANT MARINER'S DOCUMENT:**

A. MERCHANT MARINER'S DOCUMENT WITHOUT A QUALIFIED RATING:

Evaluation Fee	Exam Fee	Issuance Fee
0	0	$35.00

B. MERCHANT MARINER'S DOCUMENT WITH A QUALIFIED RATING:

Evaluation Fee	Exam Fee	Issuance Fee
$60.00	$40.00	$35.00

C. MERCHANT MARINER'S DOCUMENT WITH A QUALIFIED RATING ISSUED INCIDENT TO A LICENSE TRANSACTION:

Evaluation Fee	Exam Fee	Issuance Fee
0	$40.00	$35.00

Note: Exam Fee is charged only if a qualified rating examination is administered.

Qualified rating exams include: Lifeboatman (written and practical) QMED, Able Seaman, Tankerman.

ENTRY RATINGS: No examinations are required for entry ratings. Ordinary Seaman (Deck Department), Wiper (Engine Department), Steward's Department (Food Handler).

Persons suffering from abnormal vision or other serious physical defects are advised that such defects may **disqualify** issuance of a document for a higher rating and/or endorsement.

MINIMUM AGE REQUIREMENTS:
No Merchant Mariner's Document shall be issued to an applicant under 16 years of age. Applicants between the ages of **16** and **18** must have Parental or Guardian Consent. The form can be obtained through this office.

NAME CHANGES:
An applicant must present a marriage certificate, court order or a dissolution of marriage decree showing a name other than the one on your birth certificate.

NATIONAL AGENCY CHECK:
All Permanent Resident Aliens,(including American-Samoans), must fill out an Intelligence Agency Check Request Form CG-2765.

WHERE THERE IS A PAST DRUG INVOLVEMENT, USAGE, ARREST OR CONVICTION: Merchant Mariner's Documents or continuous discharge books shall not be issued to any person who, within 10 years prior to the date of filing the application, has been convicted in a court of record of a violation of the narcotic drug laws of the United States, the District of Columbia, or any State or Territory of the United States, unless such person has submitted sufficient evidence to the Commandant to reasonably warrant the conclusion that he is no longer involved with or associated with narcotics and is suitable for employment on board merchant vessels of the United States (46 CFR 12).

The Applicant shall Provide the Following Information:

1. A complete statement detailing any illegal drug usage, Arrest(s) and /or convictions.

2. A letter from all employer's (that you have worked for since the Illegal Drug Usage, and Conviction) attesting to the quality of your employment and stating whether or not you are eligible for hire.

3. A letter report from your probation/parole officer relating to your performance and progress while on probation/parole, if applicable.

4. Three Letters of character reference from reputable citizens who have associated with you (since the Narcotic Involvement, Arrest and Conviction), stating that you are no longer involved in narcotics.

5. If presently on probation or parole your application will not be processed.

Individuals meeting the requirements above may be issued either a Merchant Mariner's Document or a Temporary Document.

QUALIFIED MEMBER OF THE ENGINE DEPARTMENT (QMED)

REFERENCE: 46 CFR 12.15 (Code of Federal Regulations)

PROOF OF EXPERIENCE

1. Certificates of Discharges (CG-718A)
2. Military Experience (DD-214), Military Sealift Command Service, Evaluated at 60% of time.
3. Foreign Sea Service - Continuous Discharge Book
4. Letters from Companies on Letterhead paper indicating Engine Room Experience.
5. A total of 6 months Sea Service in the Engine Room is required. (180 Days)- **VESSELS AT LEAST 100 GROSS TONS**
6. INPORT TIME TOWARD UNLICENSED RATINGS Unlicensed engineers perform many of the same duties while they are in port as when underway. Therefore, credit for standby (in port) wiper time toward QMED ratings is creditable on a 3 for 1 basis up to half (50%) of the required time. This policy is consistent with the crediting of equivalent service to license applicants with port engineer/instructor employment. This service used in conjunction with that allowed by an approved course may not exceed one-half (1/2) of the total at sea time to qualify for the rating(s). (Reference: Policy Letter #19, Section 13)

MSC PERSONNEL - Evaluated at 60% for Low-TEMPO Sea Service
MSC PERSONNEL - Evaluated at FULL SERVICE for HI-TEMPO Sea Service (Must present letter of Service from MSC Personnel Office.

CITIZENSHIP:

1. U. S. or Resident Alien

MINIMUM AGE:

1. 18 years

PHYSICAL REQUIREMENTS:

*1. Physical Exam on CG-Form 719K is required
2. Vision at least 20/200 in each eye, uncorrected and must be corrected to at least 20/50 in each eye
3. Color Vision - Ability to distinguish the colors: RED - GREEN - BLUE and YELLOW
4. Speak and Understand English.
*5. Drug Free Certificate. From a SAMHSA (formerly NIDA) approved laboratory (**Dated within the past 6 months**).

***FOR ORIGINAL QMED ONLY NOT REQUIRED WHEN APPLYING FOR ADDITIONAL ENDORSEMENTS.**

SCOPE OF EXAMINATION:

The **QMED-GENERAL (firefighting)** test module is administered as a part of each specific rating exam. It must be completed within the past 12 months in order to sit for any of the QMED endorsements.

The test for **QMED-GENERAL** test module must be completed with a score of 70% or higher before an applicant will be allowed to sit for any of the endorsements.

All exam modules consist of 50 questions and must be passed with a score of 70% or higher.

You have 90 days to complete 3 tries at passing each exam module. You must wait 60 days to retest an exam module which is failed 3 times and pay an additional examination fee.

QMED ENDORSEMENTS

FIREMAN / WATERTENDER....70%..Boilers, parts of, auxiliaries, functions, operations, and use of tools and instruments.

OILER.....70%..Boilers as above and Turbines, constructions operation of, also Feedwater and Lube Oil Systems.

REFRIGERATING ENGINEER...70%..Functions, operations and maintenance of various machines and systems. (Freon)

ELECTRICIAN.....70%..Construction (parts) of motor, functions & operation of, also classification and use of various types of windings.

DECK ENGINEER.....70%..General as listed under Electrician, Refrigerating Engineer.

PUMPMAN.....70%..Pumps (reciprocating and centrifugal).

MACHINIST.....70%..General machine shop knowledge. Boiler parts, construction and design.

JUNIOR ENGINEER.....70%..All of the above with additional electrical and Refrigerating questions.

ENGINEMAN: Six (6) months sea service in any one or combination of Junior Eng., Fire/watertender or Oiler on stm. vessels of 4000 hp or over.

DECK ENG. MECHANIC: Six (6) months sea service in the rating of Junior Engineer on steam vessels of 4000 horsepower or over.

The endorsements for Engineman and Deck Engine Mechanic may also be obtained in the following manner:

1. Engineman - Present documentary evidence (letter) from an operator (Master or Chief Engineer) of a "partially automated" steam vessel that the seaman has completed satisfactorily at least 2 weeks indoctrination and training in the engine room of a "partially automated" steam vessel of 4000 horsepower or over.

2. Deck Engine Mechanic - Present documentary evidence (letter) from an operator (Master or Chief Engineer) of a "Automated" vessel that the seaman has completed satisfactorily at least 4 weeks indoctrination and training in the engine department of an automated steam vessel of 4000 horsepower or over.

LIFEBOATMAN

REFERENCE: 46 CFR PART 12.10 (Code of Federal Regulations)

MINIMUM AGE: 18

CITIZENSHIP: Applicant does not have to be a U. S. citizen, but proof of citizenship or nationality is required.

PAPERWORK REQUIREMENTS:

(A) Seaman's Certification Application (Form 719 B)
(B) Proof of citizenship or nationality
(C) Social Security
(D) Certificate of Discharge or Transcript of Sea Service
(E) 3 Photos
*** *See example on Page 5 of this info. packet.* ***
(F) NIDA DRUG FREE (see page 6)

EXPERIENCE REQUIREMENTS:

(A) 360 days in the deck department of vessels on oceans, coastwise, Great Lakes, or bays, lakes or,
(B) 720 days in other than deck department or
(C) Successful completion of a Coast Guard approved training course that includes a minimum of 30 hours actual lifeboat training, along with three months sea service.

PHYSICAL REQUIREMENTS:

NO physical exam required.

SCOPE OF EXAMINATION: **70% Passing (70 Questions - Multiple Choice) You have 90 days to complete 3 tries at passing this module, without paying any additional examination fees.**

WRITTEN:
(A) Life Rafts, Survival Equipment
(B) Lifeboats, Davits
(C) Inflatable Life Rafts
(D) Oar Commands

*PRACTICAL: Demonstrate launching and recovery of gravity davit lifeboat.
MUST pass lifeboat written test before taking lifeboat practical test.

Testing Dates For Practical Examination: BY APPOINTMENT ONLY
Call for Appointment (510) 437-3092

ABLE SEAMAN

REFERENCE: 46 CFR PART 12.05-3 (Code of Federal Regulations)
MINIMUM AGE: 18
CITIZENSHIP: Applicant does not have to be a U.S. Citizen, but proof of citizenship or nationality is required.

PAPERWORK REQUIREMENTS:
(A) Certificates of Discharge (CG-718A)
(B) Transcript of Military Sea Service
1. Military sea service is evaluated at 60% time shown.
(C) Foreign Sea Service-Continuous Discharge book.
(D) 3 Photos
(See example on Page 5 of this info. packet.)
(E) AGE 18, speak and understand English to perform duties as Able Seaman.

PHYSICAL REQUIREMENTS:
(A) Physical exam on form CG-719k is required.
(B) Vision: At least 20/200 in each eye uncorrected and must be corrected to at least 20/40 in each eye. Color vision must be normal.
(C) Drug test - see page 6.

SCOPE OF **EXAMINATION:** 70% Passing
Written: 100 Questions - 2 Separate Exam Modules Graded together. You have 90 days from the date you begin to complete 3 tries at passing this written exam without paying an additional examination fee.

Subjects : General Seamanship, General Navigation, Marlinspike Seamanship, Safety, Pollution Prevention, firefighting, First Aid/CPR, International/Inland Rules of the Road, Lifeboatman or Liferaft equipment

PRACTICAL: Five (5) knots and splices - 80% passing (must successfully complete 4 of the 5 knots/splices, and identify.

"ABLE SEAMAN QUALIFICATIONS AND EXPERIENCE REQUIREMENTS"

***ON VESSELS AT LEAST 100 GROSS TONS. LIFEBOATMAN ENDORSEMENT REQUIRED.**

****ON VESSELS AT LEAST 65' IN LENGTH. LIFEBOATMAN ENDORSEMENT REQUIRED.**

* (A) Able Seaman **ANY WATERS UNLIMITED - 1080** days deck service on vessels operating on Oceans or Great Lakes
* (B) Able Seaman **LIMITED - 540** days on deck on vessels not exclusively on rivers or smaller inland lakes of the U. S.
** (C) Able Seaman **SPECIAL - 360** on deck on vessels oceans or navigable waters, including the Great Lakes.

(D) Able Seaman SPECIAL (Off Shore Supply Vessels) - 180 days Sea Service on deck on Oceans or the Navigable Waters of the United States including Great Lakes on Vessels over 15 gross tons. Lifeboatman examination **NOT** required.

TANKERMAN

REFERENCE: 46 CFR PART 12.20 (Code of Federal Regulations)

MINIMUM AGE: 18 Applicants under 18 years of age must have parental consent

CITIZENSHIP: Applicants do not need to be U.S. Citizens, but proof of citizenship or nationality is required.

WHEN NEEDED: A certificated tankerman or licensed officer (Master, Mate, Pilot, or Engineer) is required whenever transporting or transferring flammable liquid cargoes in a vessel, barge or container of more than 110 gallons capacity.

RESTRICTIONS: A tankerman is restricted to handling only those grades of cargo for which his certificate is endorsed. The restriction is based on his experience. The restriction placed on the original document can be upgraded when the tankerman has gained additional experience with higher grades of cargo and presents and appropriate letter of service.

TANKERMAN ENDORSEMENTS: The endorsement on an MMD for the tankerman rating shall be limited to the grades of liquid cargoes (or LFG, as appropriate) that the applicant is qualified to handle. Endorsements shall be made as follows:

a. Tankerman (All Grades and LFG) - if the applicant is qualified to handle all types of liquid and gas cargoes.

b. Tankerman (Grade A and all lower grades) - if qualified to handle all grades of flammable and combustible liquids.

c. Tankerman (Grade B and all lower grades) - if qualified to handle Grade B and C flammable liquids and Grade D and E combustible liquid cargoes.

d. Tankerman (Grades D and E) - if qualified to handle Grade D and E combustible liquid cargoes.

e. Tankerman (Grade E) - if qualified to handle Grade E combustible liquids only.

f. Tankerman (LFG) - if qualified to handle liquefied flammable gases only.

g. Tankerman (Grade B and all lower grades and LFG) - if qualified to handle such grades of flammable liquids and combustible liquids and liquefied flammable gases.

PAPERWORK REQUIREMENTS:

a. Complete Application for Original Document. **(See page 21 of this packet.)**

b. Physical examination on Form CG 719k.

c. Proof of citizenship or nationality.

d. Letter of Service. Graduates of CMA Tankerman course must still submit letter of service and certificate of completion.
(See Page 17 for example letter format.)

e. Social Security Card.

f. 3 photographs

g. Drug Free Certificate (see page 6)

*** *See example on Page 5 of this info. packet.* ***

TRAINING: An applicant shall be eligible for certification as tankerman after he/she has furnished satisfactory evidence (service letter, page 17) to this office that he/she is trained in and capable of performing the required duties of certified Tankerman.

PHYSICAL REQUIREMENTS:

a. Must be examined by a reputable physician and the results recorded on form CG 719K.

b. Vision: At least 20/100 uncorrected in both eyes and correctable to 20/30 in one eye and 20/50 in the other. Color vision must be normal by the pseudo-isochromatic plate test or "Farnsworth" lantern test.

SCOPE OF EXAMINATION: Multiple Choice, covering: One Part - Tankerman General which has 50 multiple choice questions, passing score is 70%, additional module for LFG. You have 90 days from the date you begin to complete 3 tries at passing this exam without paying an additional examination fee.

a. Certificate of Inspection
b. Barge equipment (valves, pumps, hoses)
c. Tank Barge Safety, Pollution Prevention
d. Transfer procedures, grades of cargo
e. First Aid/CPR, Firefighting procedures/equipment

f. Candidates for an LFG endorsement must take an additional 15 question examination on LFG operations and show additional training in the handling of those cargoes. (letter by employer is required).

SUGGESTED REFERENCE MATERIAL:

Marine Fire Prevention, Firefighting and Fire Safety
(Refer to Page 17 on how to obtain this Manual.)
33 CFR SubChapter O - Pollution, parts 151-159
46 CFR SubChapter D - Tank Vessels

UNLIMITED MASTERS AND MATES

U. S. COAST GUARD LICENSING GUIDE TO MARINERS

REVISED: FEB 1994

USER FEES FOR MASTER AND MATE'S LICENSES

IF APPLICANT HAS NOT HAS A PREVIOUS LICENSE:

	EVALUATION FEE	EXAMINATION FEE	ISSUANCE FEE
UNLIMITED	$87	$150	$35

IF APPLICANT IS UPGRADING LICENSES:

	EVALUATION FEE	EXAMINATION FEE	ISSUANCE FEE
UNLIMITED	$70	$150	$35

ENDORSEMENT ON LICENSES:

	EVALUATION FEE	EXAMINATION FEE	ISSUANCE FEE
STEAM OR MOTOR	$45	$55	$35

II. GENERAL REQUIREMENTS

Applicants for licenses are charged with the duty of establishing to the satisfaction of the Coast Guard that they possess all of the qualifications necessary, such as age, experience, character, physical exam, training, and citizenship before approval for examination and licensing. You may submit your application by mail or by visiting our office. Office hours are from 7:30 a.m. until 3:30 p.m., Monday through Friday, except Federal holidays. Applications may be obtained and questions answered by calling the exam center between the hours of 7:30 a.m. and 4:00 p.m.

The following items are required by this office and must be approved before taking a Coast Guard examination unless, otherwise specified by our office.

A. APPLICATION

1. FORM CG-866:

Each mariner seeking an original license, raise of grade, renewal, increase in scope, or extension of route must complete form CG-866. The application process is used to establish that an applicant is qualified for the desired license. Examination for, and license issuance, cannot begin until the application is reviewed and approved by the Coast Guard. It is the responsibility of the applicant to prepare the application form properly and to conduct whatever research is necessary to do so. To ensure that applicants understand block numbers 20 and 21 on the application form, "DRIVING WHILE INTOXICATED (DWI) AND DRIVING UNDER THE INFLUENCE (DUI) ARE CONSIDERED MORE THAN MINOR TRAFFIC VIOLATIONS," please initial these blocks. If you answer yes to either of these blocks you must offer an explanation in block number 22. Also ensure you sign the reverse side of the form in block 23. Approved license applications are only valid for one year. If the desired license is not obtained within that period, it will be necessary for the applicant to reapply.

1a. CHARACTER REFERENCES:

Each applicant for an original license shall submit written recommendations concerning the applicant's suitability for duty from a master and two other licensed officers of vessels on which the applicant has served. The references may be provided on the Application form CG-866. For a license as engineer or as pilot, at least one of the recommendations must be from the chief engineer or licensed pilot, respectively, of a vessel on which the applicant has served. For a license as operator of uninspected towing vessels, the recommendations may be from recent marine employers with at least one recommendation from a master, operator, or person in charge of a vessel upon which the applicant has served. Where an applicant qualifies for a license through an approved training school, one of the character references must be an official of that school.

For a license for which no commercial experience may be required, such as: master or mate up to 200 gross tons, operator of uninspected passenger vessels, radio officer or certificate of registry, the applicant may have written recommendations of three persons who have knowledge of the applicant's suitability for duty.

2. CITIZENSHIP

Applicants must present acceptable proof of U.S. Citizenship. We may reject any evidence of citizenship that is not believed to be authentic. Identification should agree with current name. Bring any original records of name changes, divorce (which may affect name change), etc... Acceptable evidence of citizenship may be an original or certified copy of the following:

(i) Birth certificate or birth registration
(ii) Certificate of naturalization
(iii) Baptismal certificate or parish record recorded within one year after birth
(iv) Statement of a practicing physician certifying attendance at the birth and who possesses a record showing the date and location at which it occurred
(v) State Department passport
(vi) A Merchant Mariner's Document issued by the Coast Guard which shows the holder as a United States citizen
(vii) Delayed certificate of birth issued under a state seal in the absence of any collateral facts indicating fraud in its procurement
(viii) Certificate of citizenship issued by the United States Immigration and Naturalization Service

If none of these requirements can be met by the applicant, the individual shall make a statement to that effect, and may submit data of the following character for consideration:

(i) Report of the Census Bureau showing the earliest available record of age of birth. Request for such information should be addressed to the Personal Census Service Branch, Bureau of the Census, Pittsburgh, Kansas 66762. In making such request, the use of form BC-000, Application for Search of Census Records, furnished by the Bureau is required.
(ii) Affidavits of parents, relative, or two or more responsible citizens of the United States attesting to your citizenship.
(iii) School records, immigration records, or insurance policies.

If you are a non-U.S. citizen, you may only apply for an Operator of Uninspected Passenger Vessels (OUPV) license restricted to UNDOCUMENTED VESSELS. You must provide our office with your birth record and alien registration card.

III. PHYSICAL EXAMINATION REQUIREMENTS

A. FORM CG-719K:

Each application for an original license issuance must be accompanied by a completed Merchant Marine Personnel Physical Examination Report, form CG-719K. This form must also accompany all applications for license raises of grade, when the last physical record submitted is over three years old. All applicants must submit the original physical examination report. All applicants for an original license must pass an examination given by a licensed physician or a licensed physician assistant and present a completed Coast Guard physical examination form, or the equivalent, executed by the physician. This form must attest to the to the applicant's acuity of vision, color sense, hearing, and general physical condition. This examination must be completed prior to approval for sitting for an exam for a license and not more than 12 months prior to the issuance of a license. Epilepsy, diabetes, insanity, senility, acute venereal disease, neurosyphilis, badly impaired hearing or vision, or color blindness are some causes for denial of a license.

Where an applicant does not possess the vision, hearing, or general physical condition necessary, we may, after consultation with the examining physician or physician assistant, recommend a waiver to the Commandant, U.S. Coast Guard, if extenuating circumstances warrant special consideration. Applicants may submit to the Officer in Charge, Marine Inspection, additional correspondence, records and reports in support of this request. In this regard, recommendations from agencies of the Federal Government operating government vessels, as well as owners and operators of private vessels, made in behalf of their employees, will be given full consideration. Waivers are not normally granted to an applicant whose corrected vision in the better eye is not at least 20/40 for deck licenses or 20/50 for engineer licenses or whose uncorrected vision is worse than 20/400 in either eye.

B. VISION:

For licenses as master, mate, pilot, or operator, the applicant must have correctable vision to at least 20/40 in each eye and uncorrected vision of at least 20/200 in each eye. The color sense must be determined to be satisfactory when tested by any of the following methods:

(i) Pseudoisochromatic Plates (Dvorine, 2nd Edition: AOC; revised edition or AOC-HRR; Ishihara 16-24, or 38-plate editions)
(ii) Eldridge - Green Color Perception Lantern
(iii) Farnsworth Lantern
(iv) Keystone Orthoscope
(v) Keystone Telebinocular
(vi) SAMCTT (School of Aviation Medicine Color Threshold Tester)
(vii) Titmus Optical Vision Tester
(viii) Williams Lantern

U. S. Coast Guard Requirements for

ENGINEER OFFICER'S LICENSES

Steam and Motor Vessels

Chief Engineer (Unlimited)

First Assistant Engineer (Unlimited)

Second Assistant Engineer (Unlimited)

Third Assistant Engineer (Unlimited)

Chief Engineer and Assistant Engineer Limited

Designated Duty Engineer

Chief Engineer and Assistant Engineer of Uninspected Fishing Industry Vessels

USER FEES FOR ENGINEER OFFICERS'S LICENSES

IF APPLICANT HAS NOT HAD A PREVIOUS LICENSE:

	EVALUATION FEE	EXAMINATION FEE	ISSSUANCE FEE
UNLIMITED	$87	$150	$35

IF APPLICANT IS UPGRADING LICENSES:

	EVALUATION FEE	EXAMINATION FEE	ISSUANCE FEE
UNLIMITED	$70	$150	$35

ENDORESEMENT ON LICENSES:

	EVALUATION FEE	EXAMINATION FEE	ISSUANCE FEE
STEAM OR MOTOR	$45	$55	$35

II. GENERAL REQUIREMENTS

Applicants for licenses are charged with the duty of establishing to the satisfaction of the Coast Guard that they possess all of the qualifications necessary, such as age, experience, character, physical exam, training, and citizenship before approval for examination and licensing. You may submit your applicantion by mail or by visiting our office. Office hours are from 8:00 a.m. until 3:30 p.m., Monday through Friday, closed weekends and Federal holidays. Applications may be obtained and questions answered by calling exam center between the hours of 8:30 a.m. and 3:30 p.m.

The following items are required by this office and must be approved before taking a Coast Guard examination unless, otherwise specified by our office.

A. APPLICATION

1. FORM CG-866: APPLICATION FOR LICENSE AS OFFICER, OPERATOR OR STAFF OFFICER

Each mariner seeking an original license, raise of grade, renewal, increase in scope, or extension of route must complete form CG-866. The application process is used to establish that an applicant is qualified for the desired license. Examination for, and license issuance, cannot begin until the application is reviewed and approved by the Coast Guard. It is the responsibility of the applicant to prepare the application form properly and to conduct whatever research is necessary to do so. To ensure that applicants understand block numbers 20 and 21 on the application form, "DRIVING WHILE INTOXICATED (DWI) AND DRIVING UNDER THE INFLUENCE (DUI) ARE CONSIDERED MORE THAN MINOR TRAFFIC VIOLATIONS," please initial these blocks. If you answer yes to either of these blocks you must offer an explanation in block number 22. Also ensure you sign the reverse side of the form in block 23. Approved license applications are only valid for one year. If the desired license is not obtained within that period, it will be necessary for the applicant to reapply.

1a CHARACTER REFERENCES:

Each applicant for an original license shall submit written recommendations concerning the applicant's suitability for duty from a master and two other licensed officers of vessels on which the applicant has served. The references may be provided on the Application form CG-866. For a license as engineer or as pilot, at least one of the recommendations must be from the chief engineer or licensed pilot, respectively, of a vessel on which the

applicant has served. For a license as operator of uninspected towing vessels, the recommendations may be from recent marine employers with at least one recommendation from a master, operator, or person in charge of a vessel upon which the applicant has served. Where an applicant qualifies for a license through an approved training school, one of the character references must be an official of that school.

For a license for which no commercial experience may be required, such as: master or mate up to 200 gross tons, operator of uninspected passenger vessels, radio officer or certificate of registry, the applicant may have written recommendations of three persons who have knowledge of the applicant's suitability for duty.

2. CITIZENSHIP

Applicants must present acceptable proof of citizenship. We may reject any evidence of citizenship that is not believed to be authentic. Identification should agree with current name. Bring any original records of name changes, divorce (which may affect name change), etc... Acceptable evidence of citizenship may be an original or certified copy of the following:

(i) Birth certificate or birth registration
(ii) Certificate of naturalization
(iii) Baptismal certificate or parish record recorded within one year after birth
(iv) Statement of a practicing physician certifying attendance at the birth and who possesses a record showing the date and location at which it occurred
(v) State Department passport
(vi) A Merchant Mariner's Document issued by the Coast Guard which shows the holder as a United States citizen
(vii) Delayed certificate of birth issued under a state seal in the absence of any collateral facts indicating fraud in its procurement
(viii) Certificate of citizenship issued by the United States Immigration and Naturalization Service

To get a certified copy of your birth certificate write or call the Bureau of Vital Statistics for the county of the city and state you were born in. Give the full name of parents, date of birth, hospital name, and full name.

If none of these requirements can be met by the applicant, the individual shall make a statement to that effect, and may submit data of the following character for consideration:

(i) Report of the Census Bureau showing the earliest available record of age of birth. Request for such information should be addressed to the Personal Census Service Branch, Bureau of the Census, Pittsburgh, Kansas 66762. In making such request, the use of form BC-000, Application for Search of Census Records, furnished by the Bureau is required.

(ii) Affidavits of parents, relative, or two or more responsible citizens of the United States attesting to your citizenship.
(iii) School records, immigration records, or insurance policies.

III. PHYSICAL EXAMINATION REQUIREMENTS

A. FORM CG-719K:

Each application for an original license issuance must be accompanied by a completed Merchant Marine Personnel Physical Examination Report, form CG-719K. This form must also accompany all applications for license raises of grade, when the last physical record submitted is over three years old. All applicants must submit the original physical examination report. All applicants for an original license must pass an examination given by a licensed physician or a licensed physician assistant and present a completed Coast Guard physical examination form, or the equivalent, executed by the physician. This form must attest to the to the applicant's acuity of vision, color sense, hearing, and general physical condition. This examination must be completed prior to approval for sitting for an exam for a license and not more than 12 months prior to the issuance of a license. Epilepsy, diabetes, insanity, senility, acute venereal disease, neurosyphilis, badly impaired hearing or vision, or color blindness are some causes for denial of a license.

Where an applicant does not possess the vision, hearing, or general physical condition necessary, we may, after consultation with the examining physician or physician assistant, recommend a waiver to the Commandant, U.S. Coast Guard, if extenuating circumstances warrant special consideration. Applicants may submit to the Officer in Charge, Marine Inspection, additional correspondence, records and reports in support of this request. In this regard, recommendations from agencies of the Federal Government operating government vessels, as well as owners and operators of private vessels, made in behalf of their employees, will be given full consideration. Waivers are not normally granted to an applicant whose corrected vision in the better eye is not at least 20/40 for deck licenses or 20/50 for engineer licenses or whose uncorrected vision is worse than 20/400 in either eye. Applicants need only have the ability to distinguish the colors red, green, blue, and yellow.

IV. PERIODIC DRUG TESTING REQUIREMENT

The new periodic drug testing requirement became effective on 21 December 1990. The periodic testing provisions require that whenever a physical examination is required for a MERCHANT MARINE document or license transaction, including license renewal, a chemical test of the individual's urine for the presence of dangerous drugs must also be conducted. Additionally, pilots who are required to take annual physicals must include this test as a part of the physical and provide the results of the drug test to the Coast Guard with their application. Individuals renewing First Class pilot licenses or pilot endorsements must provide the results of the most recent drug test taken when applying for license renewal.

The periodic testing requirements apply to all physical examinations performed after December 21, 1990. Unless postmarked on or before that date, all applications received after that date must include satisfactory evidence that the applicant has passed a **National Institute on Drug Abuse (NIDA)** approved drug test within six months of the application. Satisfactory evidence includes:

a. A note or letter from the examining physician or Medical Review Officer stating that the applicant has passed a chemical test for dangerous drugs conducted in accordance with Title 49 of the Code of Federal Regulations Part 40.

b. A letter on company stationery indicating the NAME of the NIDA approved lab, signed by a company official indicating that the applicant passed a pre-employment test for dangerous drugs within the past six months; or,

c. For Active Duty military members, (on Active Duty for over 181 days, (ONLY)), a letter from the applicant's command indicating that the applicant has passed a chemical test for dangerous drugs, or is subject to the Military random testing program. Reserve and retired military personnel must have a drug free NIDA approved certificate.

d. A letter on Union stationery indicating the NAME of the NIDA approved lab, signed by a Union official indicating that the applicant passed a pre-employment test for dangerous drugs within the past six months.

e. Random drug testing: See page 8, question number 3.

Periodic testing is the responsibility of the applicant, not the marine employer. All results are subject to verification prior to the issuance of any marine credential. In all cases the test must be specific for the required dangerous drugs and must be conducted in accordance with Title 49 of the Code of Federal Regulations Part 40, including the use of only laboratories approved by the National Institute on Drug Abuse (NIDA).

LIST OF REFERENCES

American President Lines, LTD. (APL), *Crewing the Ready Reserve Force*, Point Paper, 1994.

Beall, T. R., LCDR, USN, "Strategic Sealift Shiplist," Headquarters U.S. Transportation Command, Scott AFB, Illinois, June 1994.

Buchanan, David, Office of Admissions, California Maritime Academy, Interview.

Childs, Felix, Director of RRF Programs, American President Lines, LTD., Interview on March 25, 1994, S. S. Comet.

Commission on Merchant Marine and Defense (CMMD), *Third Report of the Commission on Merchant Marine and Defense: Findings of Fact and Conclusions*, September 30, 1988.

Commission on Merchant Marine and Defense (a) (CMMD), *Fourth Report of the Commission on Merchant Marine and Defense: Recommendations for Action*, January 20, 1989.

Committee on Effective Manning, Marine Board, Commission on Engineering and Technical Systems, National Research Council, *Effective Manning of the U.S. Merchant Fleet (EMUSMF), National Academy Press, Washington District of Columbus, 1984.*

Diamond, Andrew P., "A Realistic Alternative", U.S. Naval Institute Proceedings, May 1993, p. 104.

Harlow, Louis F., *An Analysis of the Naval Defense Reserve Fleet, The Ready Reserve Fleet Component and Their Capability to Meet National Emergencies,* Master's Thesis, Naval Postgraduate School, Monterey, California, September 1979.

Heine, Irwin M., *The United States Merchant Marine: A National Asset*, National Maritime Council, Washington District of Columbus, July 1976.

Kessler, Philip R., *Ready Reserve Force: West Coast Activations in Support of Operation Desert Storm,* Master's Thesis, Naval Postgraduate School, Monterey, California, March 1991.

Mach, Daniel, C. and Cavin, Edward S., *Working Paper, "An Assessment of Activation Testing for the Ready Reserve Force"*, Center for Naval Analysis (CNA) 88-1906.10, October 17, 1988.

McCalla, D. J. "A Study of Maritime Labor Unions with an Emphasis on the Trend of Wages and Benefits Over the Past Ten Years," Master's Thesis, Naval Postgraduate School, Monterey, California, March 1987.

Military Sealift Command, Class Notes, Spring 1993.

Military Traffic Management Command Transportation Engineering Agency (MTMCTEA), *Logistics Handbook for Strategic Mobility Planning*, August 1989. Newport News, Virginia.

National Research Council, "Crewing Size and Maritime Safety," Washington, District of Columbus, 1990.

Orban, Mary M., *The Ready Reserve Force: Is It Capable of Performing Its Mission?*, Master's Thesis, Naval Postgraduate School, Monterey, California, December 1987.

Pouch, Robert H., *"The U.S. Merchant Marine and Maritime Industry in Review," U.S. Naval Institute Proceedings,* May 1994, p. 147.
Presearch Incorporated, *Crewing the Merchant Marine for Mobilization*, U.S. Department of Transportation (MARAD), November 1990.

Rost, Ronald F., John F. Addams, John J. Nelson, 1991. *Sealift in Operation Desert Shield/Desert Storm: 7 august 1990 to 17 February 1991.* Alexandria, Virginia. Center for Naval Analysis.

U.S. Coast Guard (USCG, MSO), "Merchant Marine Documentation," Marine Safety Office, Coast Guard Island, California, 1994.

U.S. Department of Commerce (DoC), *U.S. Merchant Marine Workforce Supply and Demand Analysis 1979-88*, Executive Summary, MARAD, December 1979.

U.S. Department of Transportation (MARAD), *Operations Plan 001A Maritime Administration Emergency Operations*, Washington District of Columbia, September 1990.

U.S. Military Sealift Command, *Military Sealift Command 1992 In Review*, Washington District of Columbia, 1993.

Winger, Mary T., *Manning the Ready Reserve Force: A Study of the Availability of U.S. Maritime Labor to Man the Ready Reserve Force*, Master's Thesis, Naval Postgraduate School, Monterey, California, December 1985.

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